Appendix 4

HABITAT CONSERVATION ACTIONS

Introduction

In this Appendix, conservation actions are described for each of the six habitat factors for decline of steelhead populations in the LCSCI area. Actions are characterized as Phase 1 or Phase 2 actions. Phase 1 actions are commitments to actions that are currently underway or are planned using existing authorities and resources. Phase 2 actions are actions that will be undertaken if additional resources, or authority if needed, are made available. These action descriptions are organized first by whether the responsible organization is a state, federal or local government agency or is a private organization and then alphabetically. Under each organization, Phase 1 actions are listed first and then Phase 2 actions.

After each action's title an identifying code is indicated. These codes are used to cross-reference the actions to the factors for decline and conservation strategies to which they relate in Chapter 14, Subchapter 2. A given action may relate to the implementation of more than one conservation strategy. These codes will also be used to help monitor the implementation of actions. The action descriptions indicate which factor(s) for decline the actions are intended to address. Many actions relate to more than one of the factors for decline, indeed, many actions broadly relate to all six factors for decline. A contact name and phone number is provided for each action.

The actions that are described, particularly for federal and local government agencies and private organizations, are not all actions that are being taken to protect and restore steelhead habitat. As descriptions of additional actions may be provided, they will be included in subsequent LCSCI documents.

I. STATE GOVERNMENT CONSERVATION ACTIONS

This information represents a baseline of current and proposed actions by state agencies to protect and restore steelhead and other salmonid habitat. Additional and more specific information on some of these actions and the priority streams and steelhead stocks to which they are directed is provided under "Priority Habitat Conservation Actions" in Chapter 15. However, the adequacy of individual actions and the overall adequacy of the entire package of state, federal, and local actions in addressing the habitat factors for decline and protecting and restoring steelhead habitat cannot be fully evaluated until watershed assessments and management plans for each of the priority watersheds in the LCSCI area are completed.

Agency: Washington Department of Agriculture

Phase I Action

Title: Public Outreach, Stakeholder Work and Planning (AGR-101)
Description: The Department of Agriculture has been active on the LCSCI Steering Committee to assist in the overall planning effort and its subcommittees, including chairing the Outreach subcommittee. We see our primary impact in providing outreach and leadership in the agricultural stakeholder arena. We are also working in partnership with the state Conservation Commission to develop practical strategies to deal with private landowner issues relative to the Endangered Species Act.
Contacts: Lee Faulconer (360) 902-1804 and Linda Crerar (360) 902-1818

Agency: Lower Columbia River Estuary Program (LCREP)

Phase 1 Actions

Title: LCREP Management Plan (CRE-101)
Relevant Factors for Decline: All Six Factors
Description: The Lower Columbia River Estuary Program (LCREP) is a cooperative effort between the states of Oregon and Washington and the federal government under the National Estuary Program.. The program provides a forum for consensus building among interested parties and users to identify environmental problems, evaluate existing management framework, recommend priority actions and to develop a comprehensive management plan. The LCREP study area is defined as that portion of the Columbia River and its tributaries that are tidally influenced which includes the mainstem river from the Ocean to Bonneville Dam. The management plan when completed in 1999, will consist of a series of actions designed to address seven key issues (problem areas) identified by a five year water quality monitoring program. The issues include: habitat loss and modification, conventional pollutants, toxic contaminants, land use and development practices, institutional constraints, biological integrity, public awareness and stewardship. Implementation of the actions are anticipated to result over time in improved estuary and lower river habitat, improved water quality, decreased sedimentation and improved overall management coordination.
Partners: 31 member management committee with broad representation of stakeholders from lower river including: federal, state and local governments, private industry, environmental groups, the public, and the tribes.
Contact: Debrah Marriott, (503) 229-5421

Title: Action, Demonstration and Planning Grants Program (CRE-102)
Relevant Factors for Decline: All Six Factors
Description: In June of 1997, LCREP provided funding to six small scale projects on the lower river designed to address LCREP priority issues. Two of the

projects funded are on the Washington side of the lower river. The projects, which focus on using and educating local students, include: (1) efforts to restore the habitat and water quality of the Chinook River, and (2). a stream overflow protection project on Birnie Creek in Cathlamet. In each case, the projects are expected to improve stream conditions for migratory salmonids. LCREP will be soliciting for new grant proposals in October 1997 with $75,000 in grant funds to be awarded in March 1998.
Partners: LCREP, Sea Resources, Inc., Ilwaco High School, and Wahkiakum High School.
Contact: Bruce Sutherland, (503) 229-5995

Title: Lower Columbia River Long Term Monitoring Plan (CRE-103)
Relevant Factor for Decline: Impaired Water Quality
Description: The US Geological Survey in cooperation with the Columbia River Estuary Program is developing a long term water quality monitoring plan for the lower Columbia River to address problem areas and concerns identified in the Bi-State Water Quality Study of the lower river. The monitoring plan is due to be completed in the spring of 1998. The plan will address sediment contamination and sources, fish tissue, water column water quality, and habitat. Elements of the plan will then be implemented by the various agencies participating in the development process. Targeted implementation date would be summer or fall of 1998.
Partners: USGS, EPA, USACE, NMFS, US Fish and Wildlife, Wash. Ecology, Wash. Health, Wash. Fish and Wildlife, Oregon DEQ, OR Fish and Wildlife, University of Washington, Oregon State University, Oregon Graduate Institute, Columbia River Intertribal Fish Comm., Oregon Trout, Port of Portland, CREP.
Contact: Bruce Sutherland, (503) 229-5995 and Greg Fuhrer USGS (503) 251-3231

Phase 2 Action

Title: Management Strategies to Improve Lower Columbia River Biological Integrity (CRE-201)
Relevant Factors for Decline: All Six Habitat Factors
Description: Implementation of the Lower Columbia River Estuary Management Plan will entail a series of actions which focus on a prioritized list of problem areas relative to the biological integrity of the lower river. Authorization, resources and responsibility for the each of the action items are yet to be determined but as these are identified it is expected that action items will go forward. The plan is due for completion in June 1999. Although it is hoped that some action items can be addressed sooner as resources become available, most implementation will be dependent on additional funding beginning July 1999.
Funding: The LCREP Financial Committee will be developing a funding proposal in 1998. At present it is unclear how much funding will be sought and from what

sources but a variety of options will be explored including continued funding from the Washington and Oregon General Funds.
Partners: Federal, state and local agencies, private industry, environmental groups, educational institutions and the tribes.
Contact: Debrah Marriott, (503) 229- 5421

Agency: Department of Community, Trade, and Economic Development

Phase 1 Actions

Title: Public Works Trust Fund (PWTF) (CTE-101)
Relevant Factor(s) for Decline: Impaired Water Quality
Description: The PWTF will provide (pending legislative approval) low interest loans to the following communities for the purpose of upgrading their water/sewer/stormwater systems to meet state and water quality standards. These projects will be implemented during the 1997-1998 fiscal year and should increase water quality for both human needs as well as the needs of fish in the surrounding surface water bodies.

Year	Jurisdiction	Project	Loan Amount
1997	Camas	water	$900,000
1997	Camas	sewer	290,655
1996	Cathlamet	water	1,749,300
1996	Kalama	water	68,756
1997	Kalama	water	851,878
1996	Kelso	stormwater	155,400
1997	Kelso	water	95,049
1997	Morton	sewer	250,000
1998	Morton	sewer	226,000
1996	Mossyrock	water	33,200
1996	Toledo	water	724,311
1997	Woodland	water	1,797,000
1998	Lewis Co.	water	1,120,000
	Total		$8,261,549

Contact : Pete Butkus, (360) 586-7186

Title: Community Development Block Grants (CDBG) (CTE-102)
Relevant Factor(s) for Decline: Impaired Water Quality
Description: The CDBG program is providing the following assistance to local communities in ESU 4 to enhance local water quality:

City of Longview: 1997 loan for $500,000 to construct sanitary sewer and water systems for the Mint Farm Industrial Park.

Port of Ridgefield: 1996 loan for $419,000 to construct sanitary piping,

water mains, a water storage tank and a stormwater retention pond.
Toledo: 1997 loan for $364,702 to upgrade their sewer and water system.
Total for all projects: $1,283,702

Although the focus of these projects is to provide necessary infrastructure for local economic development efforts, each will have direct and indirect public health and environmental benefits in the areas by enhancing local water quality.
Contact: Charmaine Stouder, Program Manager, (360) 586-1243

Agency: Conservation Commission

NOTE: The Conservation Commission provides dollars from several sources to conservation districts. In addition, districts leverage money from other sources to accomplish their goals. While each source of funding has its own parameters, the districts decide the details for each project. The Commission also has a competitive grants program for which funds have yet to be fully distributed.

Phase 1 Actions

Title: Water Quality Implementation Grants (CCO-101)
Relevant Factors for Decline: Impaired Water Quality
Description: The six conservation districts which comprise ESU 4 have each received water quality implementation grants in the amount of $80,000 for the 1997-99 biennium. Each district has devised its own program, within the guidelines of the Commission. Following are the programs each district has identified for the current biennium:

Clark County Conservation District: This District concentrates its activities in three local watersheds: Cedar Creek, Breeze Creek and Gee Creek. The District has hired a coordinator to manage projects and coordinate volunteer activities, and has combined these funds with other sources to create a technical assistance/financial assistance program for landowners in these watersheds. They are also implementing a riparian native plant program.

Cowlitz Conservation District: High priority watersheds are Mill Creek, Abernathy Creek, Germany Creek, Coal Creek, Clark Creek, and Leckler Creek. Other watersheds impacted with these funds are Hazel Dell Creek, Arkansas Creek, Silver Lake, Cowlitz River, Coweeman River, Kalama River and Lewis River. The general goal in the high priority watersheds is to establish up to six “Watershed Community Advisory Committees” to address nonpoint source pollution and implement BMPs based on watershed needs. The District has a goal of providing up to 200 landowners with the technical assistance necessary to meet watershed needs.

Lewis County Conservation District: This District will use a portion of these funds to provide technical assistance for BMP implementation on dairy farms and other sources of nonpoint pollution in those portions of the

Cowlitz River watershed that are within District boundaries.
Pacific Conservation District: See details for the Wahkiakum Conservation District.
Underwood Conservation District (Skamania County): District priorities are on streams listed in the current 303(d) list. The one waterbody on that list within ESU 4 is the Wind River. Additionally, the District provides financial and technical assistance on forest lands in cooperation with the DNR forest stewardship program.
Wahkiakum Conservation District: District priority watersheds include the Grays River, Elochoman River, Skamokowa River and Hull Creek. The District provides technical assistance for resource planning and BMP implementation including livestock exclusion, alternative watering sources, waste management and streambank stabilization.

Contact: Steve Meyer, (360) 407-6200

Title: Dairy Waste Management Grants (CCO-102)
Relevant Factors for Decline: Impaired Water Quality
Description: Of the six conservation districts in ESU 4, four (Clark, Lewis, Pacific and Underwood) have received, or are in the process of applying for, dairy waste management grants for the 1997-99 biennium. The remaining districts are expected to submit applications for funding in the near future. Each district has devised its own program, within the guidelines of the Commission.
In general, the districts are working to reduce levels of water quality contaminants by providing technical and financial assistance to dairy operators for the development and implementation of complete dairy waste management systems. These systems include a completed dairy waste management plan specifying structural, cropping and nutrient management Best Management Practices.
Structural BMPs may include, but are not limited to: debris basins; dikes; diversions; fencing; irrigation systems; pond sealings or linings; subsurface drains; surface drains; waste storage ponds; and waste storage structures.
Cropping BMPs may include: selection of forage; grazing rotation systems; pasture management; and pasture planting.
Nutrient management BMPs are practices designed to effectively utilize on-site nutrients while preventing discharges to surface and ground waters of the State.
The Underwood Conservation District has joined with three other conservation districts to provide maximum leverage to Commission grant funds. The total grant award has been prorated to reflect the expected expenditures in the Underwood Conservation District.
To date, the Commission has awarded $273,475 in dairy waste management funds to four conservation districts in ESU 4, and more awards are likely.
Contact: Steve Meyer, (360) 407-6200

Phase 2 Actions

Title: Grants to Conservation Districts for In-stream and Riparian Fisheries Habitat (CCO-201)
Relevant Factors for Decline: Fish Access and Barriers to Passage, Decreased Channel and Floodplain Complexity, Riparian Areas and Wetland Degradation, Impaired Water Quality, Sediment Transport and Fine Sediments
Description: The Commission will provide grants to conservation districts for design and financial assistance to private landowners to protect, enhance and restore instream and riparian fisheries habitat. For the second year of the current biennium, the Commission proposes a targeted grant program following this outline:
The Commission, conservation districts, and the Washington Department of Fish and Wildlife (in cooperation with the applicable tribal governments) will designate watersheds in southwest Washington where the grant program is to be available. These watersheds must contain endangered, threatened, or petitioned wild salmonids under the federal Endangered Species Act.
Districts will approach private landowners in the designated watersheds to seek their active participation in the program. These private landowners must own land which is immediately adjacent to streams, rivers, lakes and/or estuaries in these watersheds.
Districts, in cooperation with the landowner and fisheries managers, will design the habitat practices to be installed. Technical assistance from the USDA Natural Resources Conservation Service and other conservation partners will be utilized as necessary.
The districts will provide cost-share to participating landowners for installation of the practices. Current Commission policy allows up to 100% cost-share for in-stream and riparian practices.
The Commission will provide grants to districts to cover the costs of providing technical and financial assistance.
Additional financial resources necessary: at least $937,500 will be needed for this one-year program.
Beneficial results expected include: mitigation of key fish passage barriers; return of large woody debris to stream reaches where complexity and habitat are insufficient to support a healthy salmonid fishery; restoration of diverse native species of woody plants to degraded riparian areas; and installation of erosion-controlling Best Management Practices to reduce sedimentation.
Contact: Steve Meyer, (360) 407-6200

Title: Non-point Water Pollution Reduction Program (CCO-202)
Relevant Factors for Decline: Impaired Water Quality, Sediment Transport and Fine Sediments, Basin Hydrology and Stream Flow
Description: The Commission's strategic plan calls for augmenting the ability of conservation districts to protect, restore and enhance our natural resources on a landscape basis. A key part of that effort is providing increased resources for

conservation district activities which reduce opportunities for non-point water pollution from private lands.

The following proposal has been developed for two primary reasons. First, as part of a larger watershed-based process, resource managers have stated unequivocally that reducing the opportunity for non-point water pollution from private land remains a key to ensuring healthy fish runs. Second, non-point sources are recognized as the major source of pollution in many critical salmon-bearing water bodies. This proposal will build on previous watershed-based salmon habitat efforts supported by the Commission and enhance the districts' ability to take an active role in significantly reducing non-point water pollution which impacts wild salmonids.

Under this proposal, the Commission will provide grants to conservation districts for technical and financial assistance to private landowners to: (1) protect lands outside the riparian area with the potential to impact salmonid habitat through non-point water pollution; and (2) capitalize on the great interest among private landowners and fish managers in a state-operated conservation reserve program.

The Non-point Water Pollution Program will follow this outline:

The Commission, conservation districts, and the Washington Department of Fish and Wildlife (in cooperation with the applicable tribal governments) will designate watersheds where the grant program is to be available. These watersheds must contain endangered, threatened, or petitioned wild salmonids under the federal Endangered Species Act.

Districts will approach private landowners in the designated watersheds to seek their inclusion in the program. These private landowners must own land which impacts salmon-bearing streams, rivers, lakes and/or estuaries in those watersheds.

Districts will design (with appropriate assistance from other conservation partners as necessary) the habitat practices to be installed.

The districts will provide cost-share to the landowner for installation of the practices. Current Commission policy allows 50% Commission contribution to cost-share for upland practices with the landowner contributing at least 25% of the cost of the practice.

The Commission will provide grants to districts to cover the costs of providing technical and financial assistance to participating private landowners.

The State Conservation Reserve Program will be operated as follows:

The Commission, conservation district, and the Washington Department of Fish and Wildlife (in cooperation with the applicable tribal governments) will designate watersheds where the grant program is to be available. These watersheds must contain endangered, threatened, or petitioned wild salmonids under the federal Endangered Species Act.

Districts will approach private landowners in the designated watersheds to seek their inclusion in the program.

Districts will design (with appropriate assistance from other conservation partners as necessary) the habitat practices to be installed.

The districts will provide cost-share to the landowner for installation of the practices, with the cost-share rate being higher for those landowners willing to

increase the area provided ("set-back") for habitat protect.
The districts will enter into ten-year rental agreements with the landowner to ensure that the habitat improvements are maintained.
The Commission will provide grants to districts to cover the costs of providing technical and financial assistance and rental payments.
If the program is established so that the rental rates are paid to the landowner over a ten-year period, then:
Projects could be started any fiscal year in which the program is authorized and funded by the legislature;
For year one in any project, it is estimated that 13% of the funds would go to technical assistance grants, 78% to financial assistance, and 9% to rental payments;
For years 2 through 10, 90% of the costs would be rental payments, 10% to technical assistance and district oversight.
If the program is established so that rental payments are made in a single year, then:
Projects could be started any fiscal year in which the program is authorized and funded by the legislature;
For year one in any project, it is estimated that 11% of the funds would go to technical assistance grants, 66% to financial assistance, and 23% to rental payments.
Funding these programs will meet the societal desire to provide for a healthy and plentiful population of salmon through reduction of non-point sources of water pollution, while not placing an undue financial burden on some private landowners.
A successful non-point reduction program will provide direct support of the actions of the Washington Department of Fish and Wildlife. In addition, it will provide indirect benefits to the Department of Ecology through improving water quality and water quantity.
Additional financial resources necessary: at least $937,500 will be necessary to fund this program for one year.
Beneficial results expected include: restoration of diverse native plant species in zones adjacent to riparian areas, and long-term maintenance of such habitat zones; reduction of sedimentation through the installation and maintenance of erosion-controlling Best Management Practices in transitional and upland areas near riparian zones; and moderation of extremes in stream flow.
Contact: Steve Meyer, (360) 407-6200

Agency: Department of Ecology/Environmental Investigations and Laboratory Services Program

Phase 1 Actions

Title: Continue Ambient Monitoring Program (ECY-101)
Relevant Factor for Decline : Impaired Water Quality
Description: Ecology's Environmental Investigations and Laboratory Services (EILS) program maintains a limited number of surface water quality monitoring

stations where sampling and testing for specific water quality parameters is conducted on a regular basis.
Contact: Ken Dzinbal, 360-407-6672

Title: Biodiversity and Habitat Monitoring (ECY-102)
Relevant Factor(s) for Decline : Impaired Water Quality, Decreased Channel and Floodplain Complexity, Riparian Areas Degradation, Fine Sediments
Description: Several ongoing efforts within EILS are aimed at characterizing the biodiversity and habitat conditions of aquatic ecosystems in Washington, including assessment of direct and indirect use of these ecosystems by salmon. These efforts include the Regional Environmental Monitoring and Assessment Program (REMAP) bioassessment projects, the Headwaters Biodiversity Project, and the maintenance of long-term bioassessment sites. In addition to providing information on the status of salmon and other aquatic biota and developing and improving bioassessment techniques, a long-term goal of these efforts is to support the development of biological criteria for incorporation in state water quality standards and other salmon protection programs. Following the characterization of stream biota in two of Washington's ecoregions, a second REMAP project will be starting up in 1997. The Headwaters Biodiversity Project, which is currently in the pilot study phase, will expand the state of knowledge on biological communities in the smallest of streams, which constitute a substantial portion of freshwater aquatic ecosystems in our state.
Contact: Will Kendra, 360-407-6698

Title: Limited Stream Temperature Monitoring Program (ECY-103)
Relevant Factor for Decline : Impaired Water Quality
Description: Ecology currently conducts continuous temperature monitoring at a few sites in the Lower Columbia conservation area.
Contact: Will Kendra, 360-407-6698

Title: 303(d) Listing and Total Maximum Daily Loads (TMDL) (ECY-104)
Relevant Factor(s) for Decline : Impaired Water Quality
Description: The federal Clean Water Act requires each state to identify, in a "303(d)" listing, waters that do not meet or are not expected to meet water quality standards and the beneficial uses, such as salmon, that the standards support. These waters are then prioritized for the development of TMDLs. Physical habitat indicators in combination with documented impacts to salmon, such as those indicated in the Salmon and Steelhead Stock Inventory, have also been used to list water bodies for violation of the narrative water quality standards. This then also triggers the need to develop TMDLs. An example is the TMDL for the Upper White River and Chinook salmon. The number of TMDLs conducted by Ecology is based upon both the water body segments and the water quality parameters that are addressed. As of October 1996, 166 TMDLs had been approved by EPA; 71 TMDLs related to the Chehalis River basin were pending approval; and another 109 TMDLs were underway. Ecology is also looking at other processes like

watershed planning and watershed analysis as opportunities to meet the requirements of a TMDL. Phase 1 actions are to continue this program.
Contact: Will Kendra, 360-407-6698

Title: Instream Flow Monitoring Stations (ECY-105)
Relevant Factor(s) for Decline : Impaired Water Quality, Basin Hydrology and Stream Flow
Description: Ecology presently conducts limited instream flow monitoring in rivers and streams in the conservation area.
Contact: Ken Dzinbal, 360-407-6672

Phase 2 Actions

Title: Expand Ambient Monitoring Program (ECY-201)
Relevant Factor for Decline : Impaired Water Quality
Description: Ecology's Environmental Investigations and Laboratory Services (EILS) program maintains a limited number of surface water quality monitoring stations where sampling and testing for specific water quality parameters is conducted on a regular basis. Phase 2 actions would be to increase ambient water quality monitoring sites in core and sanctuary areas.
Contact: Ken Dzinbal, 360-407-6672

Title: Expand Biodiversity and Habitat Monitoring Program (ECY-202)
Relevant Factor(s) for Decline : Impaired Water Quality, Decreased Channel and Floodplain Complexity, Riparian Areas Degradation, Fine Sediments
Description: Expand both the Regional Environmental Monitoring and Assessment Program (REMAP) bioassessment project and the Ambient Monitoring Program for macroinvertebrates to include biological and habitat assessment work in proposed core and sanctuary areas for wild salmonids.
Contact: Will Kendra, 360-407-6698

Title: Stream Temperature Monitoring Program (ECY-203)
Relevant Factor for Decline : Impaired Water Quality
Description: Develop a more extensive temperature monitoring network to continuously monitor stream temperature during critical life cyle periods and the summer low flow period in proposed core and sanctuary areas for wild salmonids.
Contact: Will Kendra, 360-407-6698

Title: Expand Total Maximum Daily Load (TMDL) Program (ECY-204)
Relevant Factor(s) for Decline : Impaired Water Quality
Description: Expand Ecology's TMDL program to conduct total maximum daily load studies for 303d-listed streams in priority salmonid watersheds. Expansion of the program will ensure that all impaired streams in the conservation area are provided a more complete technical pollution control analysis on a shorter timeline.

Contact: Will Kendra, 360-407-6698

Title: Intergravel Dissolved Oxygen Monitoring (ECY-205)
Relevant Factor(s) for Decline : Impaired Water Quality, Sediment Transport/Fine Sediments
Description: Implement intergravel dissolved oxygen monitoring in priority watersheds. Intergravel DO affects the success of steelhead egg hatching and fry survival. Fine sediments residing in spaces between gravel can lower DO.
Contact: Will Kendra, 360-407-6698

Title: Expand Instream Flow Monitoring Stations (ECY-206)
Relevant Factor(s) for Decline : Impaired Water Quality, Basin Hydrology and Stream Flow
Description: Establish additional instream flow monitoring stations in priority rivers and streams.
Contact: Ken Dzinbal, 360-407-6672

Agency: Department of Ecology/Shorelands and Environmental Assistance Program

Phase 1 Actions

Title: Voluntary Stewardship Approaches (ECY-126)
Relevant Factor of Decline: Riparian Areas and Wetlands Degradation
Description: Ecology provides some landowner stewardship assistance through the development and distribution of our publication on Exploring Wetlands Stewardship (#96-120). Ecology is also working to develop information for local communities about application of the "public benefit rating system", under Open Space Current Use Taxation Programs, and how to use this property tax incentive for improved watershed protection (to be completed in 1998). Ecology's regional technical assistance staff will work with willing landowners or communities interested in restoring wetlands. And Ecology's Flood Control Assistance Account Program provides grant support to local jurisdictions for floodplain management projects which consider the needs of salmonid species. Although the past focus of this program has been in the Puget Sound area, all of these activities are generally provided throughout the state, including all of the lower Columbia. Other key partners for this action are local governments and other federal and state agencies.
Contact: Jane Rubey (360) 407-7258.

Title: Regulatory Approaches to Minimize Land Use Impacts (ECY-127)
Relevant Factor for Decline: Riparian Areas and Wetlands Degradation, Decreased Channel and Floodplain Complexity, Sediment Transport, Basin Hydrology and Stream Flow
Description : Ecology currently works with local governments to incorporate concerns and needs of salmonids into GMA/SMA and CRMP planning. Grants are

provided through the Flood Control Assistance Account Program (FCAAP) and Coastal Zone Management (SZM) to locals for comprehensive planning and implementation activities. Bioengineering for bank stabilization is a key component of FCAAP. Ecology recently changed regional conditions for Nationwide Permit 26 to increase protection of fisheries resources. (Effective February1997, the Nationwide 26 cannot be used to fill wetlands within 100 ft of any stream with a channel width greater than 2 ft.) Additionally, Ecology staff review shoreline permits under SMA for development along shorelines of the state. They review and comment on 404 permits issued by the Corps of Engineers for projects involving fill of wetlands. Ecology uses state 401 water quality certification to ensure that fisheries resources and other beneficial uses are adequately protected. Finally, Ecology regional staff provide technical assistance to local governments in reviewing development projects and writing critical areas ordinances.
Contact: Bill Leonard (360) 407-7273.

Title: FCAAP Comprehensive Flood Management Plan Funding (ECY-128)
Relevant Factor(s) for Decline: Decreased Floodplain and Channel Complexity
Description: Ecology through its distribution of FCAAP funds to local governments, funds development of county flood hazard management plans. Within the LCSCI area, Cowlitz, Clark and Lewis Counties have flood hazard management plans which would not adequately address the steelhead issues presented. These plans govern maintenance of flood works, residential and non-residential development in floodplains, and emergency work or post flood repair work in both urban and rural environments. The plans significantly govern flood plain and channel morphology and simplicity factors. The plans in the LCSCI area emphasize flood "control" rather than hazard management. Key partners include County Planning and Public Works Departments, State Fish and Wildlife, and State Emergency Management Division.
Contact : Dan Sokol, (360) 407-7253.

Title: FCAAP Comprehensive Flood Management Project Funding (ECY-129)
Relevant Factor(s) for Decline: Decreased Floodplain and Channel Complexity
Description: Ecology through its distribution of FCAAP funds to local governments funds county flood control projects which implement their comprehensive flood management plans. Within the LCSCI area, Cowlitz, Clark and Lewis Counties have flood damage issues that are being addressed on a case-by-case basis which does not adequately address steelhead issues. These projects primarily arise as emergency work or post flood repair work in both urban and rural. The projects significantly affect flood plain and channel morphology and simplicity factors. These projects are frequently politicized into a "fish vs. people" formula. Key partners include County Planning and Public Works Departments, State Fish and Wildlife, and State Emergency Management Division.
Contact: Dan Sokol, (360) 407-7253.

Title: Levee Vegetation Standards Intergovernmental Committee (ECY-130)
Relevant Factor(s) for Decline: Decreased Floodplain and Channel Complexity, Riparian and Wetlands Degradation, and corresponding riverine temperature increases.
Description: Ecology is partnered with Washington Department of Fish and Wildlife, National Marine Fisheries Service, US Fish and Wildlife Service, King County, Pierce County, the City of Everett, Yakima Indian Nation, the Puyallup Tribe, and the Hoh Tribe, with support from the Portland and Seattle Districts of the US Army Corp of Engineers. The effort of this group is to influence the Corps of Engineers' Channel Stabilization Committee, Levee Vegetation Task Force in its review of Engineering Regulation (ER) 500-1-1, which governs the amount of vegetation that is permissible on non-federal levees. The Corps' Levee Vegetation Task Force is reviewing this standard under requirements of the WRDA '96 legislation. This standard prohibits any vegetation which exceeds two inch diameter breast height (dbh) and strongly prefers levees to be maintained in sod. The Intergovernmental Committee, through a consensus letter and individual letters, has urged the Corps to recognize regionally important factors in Washington State, such as salmonids and other anadromous fish, as a basis for granting authorization for a regional variation to the standards. This would allow Washington State to increase the amount of native vegetation on levees, in order to provide cover, shade, large organic debris recruitment, food source, and temperature reduction, all necessary for viable aquatic habitat.
Within the LCSCI area, each county has non-federal levees that would be impacted by such a regional variation. Key partners are listed in the preceding paragraph and, if the variation is granted, would also include County Planning and Public Works Departments, and State Emergency Management Division. If authority for variations is authorized in ER 500-1-1, then the committee will need to commit staff resources to fleshing out the appropriate vegetation standards for Washington State, both East Side and West Side.
Contact: Bonnie Shorin, (360) 407-7253 and Millard Deusen, Department of Fish and Wildlife, (360) 902 – 2562.

Phase 2 Actions

Title: Riparian and Wetland Habitat Assessment (ECY-226)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation, Decreased Channel and Floodplain Complexity, Impaired Water Quality, Basin Hydrology and Stream Flow
Description: The inventory and identification of key wetlands would be the product of applying the Puget Sound Wetlands Restoration Methodology to the Lower Columbia basin. Currently staff are applying the method only in the Puget Sound, therefore, to complete this task would require additional funding for staff to be assigned to the Lower Columbia. The author of the methodology is booked up in the Puget Sound until the end of 1998 so his availability to assist with this effort would limit the start till 1999. It would then take two to three years to

complete assessments of the Lower Columbia. Key partners would include other agencies and local communities as participants. The results of conducting the assessment would be outstanding in terms of targeting the most beneficial areas for protection and restoration of steelhead habitat.
Contact: Richard Gersib (360) 407-7259

Title: Implementing Protection and Restoration Priorities (ECY-227)
Factor for Decline: Riparian Areas and Wetland Degradation, Decreased Channel and Floodplain Complexity, Impaired Water Quality, Basin Hydrology and Stream Flow
Description: Once specific site information is available about wetlands with the highest potential to address steelhead habitat needs (obtained using the Puget Sound Wetlands Restoration Program methods mentioned above), then the task of implementing preservation and restoration actions on the ground begins. To some degree conducting an educational outreach is part of applying the Puget Sound Wetlands Restoration Methodology. The method definitely relies on implementation action conducted by landowners and the community and the building of partners on projects for restoration and protection of wetlands. Here is where additional staff support is needed to work with landowners and communities on wetland restoration efforts in the lower Columbia. Their work would need to be ongoing for years, working with communities throughout the basin. The results would be dramatic in terms of recovered habitat and species vitality. Partners would include other federal and state agencies, local governments, local communities, and landowners!
Contact: Richard Gersib (360) 407-7259.

Title: Assist Voluntary Stewardship of Wetlands (ECY-228)
Factor for Decline: Riparian Areas and Wetland Degradation, Impaired Water Quality, Basin Hydrology and Stream Flow
Description: Wetlands preservation and conservation is an integral part of salmon habitat protection that works in conjunction with restoring degraded wetlands. Providing assistance to landowners interest4ed in applying stewardship actions that preserve salmonid habitat can assure that the problems of habitat loss do not get worse. Staffing in the lower Columbia area is needed to provide this help to landowners.
In addition to the provision of technical assistance staff, the other critical need is dedicated funds to do preservation and restoration work. Currently, the absence of dedicated funding sources results in the patching in of dollars through time-consumptive competitive processes, to scrape up enough money to do some work. If we intend to see measurable progress in the short term (decade or so), a sizable funding pot must be set aside.
Contact: Jane Rubey, (360) 407-7258

Title: Enhanced Regulation to Protect Riparian Areas and Wetlands (ECY-232)
Factors for Decline: Riparian Areas and Wetlands Degradation, Decreased

Channel and Floodplain Complexity, Sediment Transport, Basin Hydrology and Stream Flow

Description: This proposed action is to enhance the level of attention to, and coordination of, regulatory and related approaches to land use impacts to riparian and wetland habitats used by steelhead in the Lower Columbia area. The proposed action would require one staff member within the Shorelands and Environmental Assistance Program at Ecology's Southwest Regional Office. This position would be assigned to the Lower Columbia area and would be a technical assistance resource, have responsibility for administering the regulatory approaches carried out by the program and for coordination with local government, other Ecology Programs and other agencies. The regulatory approaches used by the program are the Shoreline Management Act and 401 Water Quality Certification. Other related activities include flood plain management and wetlands technical assistance and coordination.

Contact: Tom Mark (360) 407-7285.

Title: Updated Shoreline Master Programs (ECY-229)

Factors For Decline: Riparian and Wetlands Degradation, Decreased Channel and Floodplain Complexity, Sediment Transport, Basin Hydrology and Stream Flow

Description: The guidelines adopted by Ecology for local master programs under the Shoreline Management Act are old and out–of-date, as are the local master programs. Updating the guidelines, including provisions for salmonids, would require that local governments update local master programs to increase protection as well. Revised guidelines are currently under development with an uncertain completion date (one year or more?). Once completed, local governments in the lower Columbia will need financial assistance to enable expeditious revisions to their ordinances. Approximately $500,000 in grant funds to assist them, would assure improved protection of shoreline and riparian areas within a 3 to 4 year period.

Contact: Tom Mark (360) 407-7285.

Title: FCAAP Comprehensive Flood Management Plan (ECY-230)

Relevant Factor for Decline: Decreased Channel and Floodplain Complexity.

Description: Revision and updating of the Comprehensive Flood Hazard Management Plans for counties within the Lower Columbia Steelhead Conservation Initiative Area could be undertaken by the Counties with a 75/25 cost split with the Department of Ecology. These revisions would be facilitated under provisions of Ecology's proposed flood planning bill to be introduced this session. "TIER ONE" flood planning, which would be called out under the flood bill, suggests significant elements that address fish habitat and mitigation needs along with flood hazard management. This will improve the projects that move forward both for safety and aquatic resource values. Also, approval of the flood bill to be introduced this session by Ecology would establish standards for "TIER ONE" flood plan development which elevates the role of DFW in flood plan

approval, and requires fish mitigation/restoration elements. TIER ONE planning also requires other fish-factor components including river-sediment management, and riparian land acquisition strategy. Results of improved flood management projects for purposes of LCSCI would include increased riparian buffering, increased channel and floodplain complexity, increased fish-friendly components in floodworks. Key Partners include County Planning and Public Works Departments, DFW, EMD, and, in this circumstance – the Legislature.
Contact: Tim D'Acci, (360) 407-6796 and Bonnie Shorin (360) 407-7297

Title: FCAAP Comprehensive Flood Management Project (ECY-231)
Relevant Factor(s) for Decline: Decreased Channel and Floodplain Complexity
Description: Identifying specific projects within the local Comprehensive Flood Management Plans within Clark Cowlitz and Lewis counties could be undertaken by the counties with a 50/50 cost split with the Department of Ecology, particularly under provisions of a flood planning bill to be proposed in 1998. Projects specifically called out within the plans which are approved by Ecology and DFW will qualify for streamlined permitting and additional consideration for emergency and post-disaster funding. This will improve the projects that move forward both for safety and aquatic resource values, if FCAAP base funds per biennium is increased in a supplemental budget request. Also, approval of the flood bill to be proposed by Ecology in 1998 establishes standards for "TIER ONE" flood plan development which elevates the role of DFW in flood plan approval, and requires fish mitigation/restoration elements. TIER ONE planning also requires other fish-factor components including river-sediment management, and a riparian land acquisition strategy. Results of improved flood management projects for purposes of LCSCI would include increased riparian buffering, increased channel and floodplain complexity, and more fish-friendly components in floodworks. Key partners include county planning and public works departments, DFW, EMD, and the legislature.
Contact: Tim D'Acci, (360) 407-6796 and Bonnie Shorin (360) 407-7297

Agency: Department of Ecology/Water Quality Program

Phase 1 Actions

Title: Watershed Management (ECY-151)
Relevant Factors for Decline: All Six
Description: The Water Quality Program has a five year cycle of activities that is applied to designated watersheds in a rotating cycle through out the state. The Lower Columbia Water Quality Management Area (WQMA) was scoped for water quality problems and issues during the last year. Based on that effort, a number of EILS projects will be done this year to gather and assess additional information so that appropriate action alternatives can be developed and selected actions can be prioritized. The Columbia Gorge WQMA will be scoped during the next fiscal year with identification of needed studies for EILS to do the following

year. These two WQMA cover the entire ESU 4 area plus additional watersheds both upstream and downstream.
In addition, Ecology is opening up a multi-program field office in Vancouver that will include two water quality staff - the basin lead covering the Lower Columbia and Columbia Gorge WQMA's and the nonpoint field specialist for the Columbia Gorge WQMA. Their full time job is to work with local agencies, groups and members of the public to better know the resources and issues in the area in order to better help coordination efforts and provide timely technical assistance and, when needed enforcement actions. Timely review of SEPA documents will help minimize new project impacts. A second nonpoint field specialist, stationed in Lacey will provide the same field component in the Lower Columbia WQMA. A strong focus for the next year is to assist in local work on the Wind, Washougal, E.Fk. Lewis and mainstem Lewis Rivers and on Salmon, Lacamas and Germany Creeks. Nonpoint TMDL discussions on the E.Fk Lewis and Salmon Ck. are likely.
Partners: Counties, towns and cities, Clark Public Utilities, Conservation Districts, Health Districts, other state and federal agencies and local interest groups.
Contact: Dave Howard, (360) 407-6298

Title: Permit Management and Compliance (ECY-152)
Relevant Factors for Decline: Impaired Water Quality, Sediment Transport, Basin Hydrology and Stream Flow
Description: NPDES permits for new and existing facilities (including sand and gravel operations), Stormwater permits (including construction sites of five acres and more and the Municipal NPDES permit for Clark Co. and DOT in Clark Co.), Dairy Waste permits, Short term WQ modifications and 401 Certification all involve assessment of local WQ conditions and establishing conditions for approval that maintain water quality. The basin approach for water quality management more clearly includes looking at discharge impacts to groundwater aquifer levels and stream flow levels where applicable. Construction sites with stormwater permits in the area will be receiving additional compliance checks and on-site technical assistance by field staff.
Partners: Local County and City permit staff and EPA
Contact: Dave Howard, (360) 407-6298

Title: State Grant and Loan Program (ECY-153)
Relevant Factors for Decline: Impaired Water Quality, Sediment Transport, Basin Hydrology and Stream Flow, Riparian Areas/Wetlands Degradation, Decreased Channel Complexity
Description: Several municipal facilities in the area have grants and or loans for facility improvements to result in higher quality effluent, reduced potential for failures and reduced groundwater inflows to piped systems. Nonpoint grants to local jurisdictions include a two year project on the E.Fork of the Lewis River to help implement Clark Co.'s watershed plan for the basin.

Partners: Clark Co., and potentially WSDOT
Contact: Chuck Meyer, (360) 407-6318 and Dave Howard, (360) 407-6298

Title: Commercial Agriculture and Dairy (ECY-154)
Relevant Factors for Decline: Impaired Water Quality, Riparian Areas/Wetlands Degradation
Description: Regional dairy specialist spends approximately one quarter time in the area working with the local Conservation Districts to provide technical assistance, responding to complaints, carrying out enforcement and developing dairy permits where needed. BMP's such as streamside fencing, proper grazing rotations and appropriate manure management are emphasized. In addition, based on scoping information last year, EILS will do a project to characterize pollution sources from agricultural areas along the Cowlitz River upstream of the Lacamas.
Partners: Clark, Cowlitz, Lewis, Skamania and Wahkiakum Co. Conservation Districts and NRCS
Contact: Marilou Pivirotto, (360) 407-6283

Title: Review of Forest Practice Activities (ECY-155)
Relevant Factors for Decline: All Six
Description: Some staff time is available from regional TFW staff to participate in site visits on request and to review scoping documents for federal watershed analysis projects. There has been little state level watershed analysis in the ESU 4 area even though much of it is forested and under commercial management. A study by Skamania Co. on the water quality and quantity (its currently very good) in the Washougal River basin highlighted the situation that the upper watershed, managed by DNR, is approaching harvest age. Consequently, an effort is planned to discuss with the Co., DNR and WAF&W the state's harvest plans, possible impacts and alternatives to minimize impacts.
Partners: DNR, WA F&W and Skamania Co.
Contact: Charles Toal, (360) 407-6299

Title: Water Quality Monitoring (ECY-156)
Relevant Factors for Decline: Impaired Water Quality
Description: Ambient monitoring of standard water quality parameters is done regularly throughout the year at several stations within the ESU 4 area. IN addition, additional locations will be monitored this year in the Elochoman, Grays, Cowlitz and Washougal Rivers. Monitoring for metals has been done in the Columbia River and the Cowlitz River near Kelso. Monitoring in the area is also done by other entities.
Partners: USGS, Clark Public Utilities, Counties, Health Districts, Conservation Districts.
Contact: Dave Howard, (360) 407-6298

Phase 2 Actions

Title: TMDL Development (ECY-251)
Relevant Factors for Decline: All Six
Description: A total of 29 rivers and streams in the ESU 4 area are listed as impaired under the 1996 303(d) list. The proposed 1998 303(d) list is substantially the same. The majority of these are impaired by nonpoint sources of pollution. Setting Total Maximum Daily Loads for nonpoint pollutants and implementing them require a great deal of time, education, expertise and cooperative efforts with local agencies and the public. TMDL development is a seven step process that includes setting target objectives, public involvement and review, establishing monitoring programs and assessing conditions over time. Additional staffing dedicated to the ESU 4 area could provide the needed expertise and time to help assess water quality issues and provide technical assistance, education and public involvement relating to agriculture, non-forestry use of federal lands, urban storm water management, land use decisions and development activities. Technical assistance would include development of one or more short booklets on who, what, where, how of several topics. These could include restoration projects, riparian development requirements and erosion control measures. It also includes organizing training opportunities held locally to meet identified needs for jurisdictions, specific business sectors (i.e. site work contractors) and the general public.
Partners: Counties, towns and cities, Conservation Districts, Health Districts, other state and federal agencies, Clark Public Utilities and local interest groups.
Contact: Dave Howard, (360) 407-6298

Title: Multi Agency Team Approach to Watershed Management (ECY-252)
Relevant Factor(s) for Decline: All Six
Description: For priority steelhead basins with mixed land-uses (those where forestry is not the dominant land use), Ecology (cross-program effort), WFW and DNR develop and implement a watershed based approach to physical habitat assessment, protection and restoration. Utilize multi-entity teams (similar to old River Basins Team) to accomplish watershed analyses procedures that identify key components of watershed function needing protection or restoration. Work with local watershed groups, local jurisdictions and the public to discuss conditions and determine best methods for accomplishing steelhead/aquatic habitat objectives. Develop implementation plans and schedule. Provide a process for monitoring implementation and success measures. All work should be accomplished in a manner that will meet federal Clean Water Act and Washington State guidance for TMDLs.
Contact: Joanne Schuett-Hames, (360)407-6296 and Dick Wallace, (360) 407-6489.

Title: Expanded Grant Funding (ECY-253)
Relevant Factors for Decline: Any or All Six
Description: Growth along the I-5, I-205 and Highway 14 corridors have burdened the resources of smaller communities to adequately respond to

development and resource issues. At the same time, some funding sources are shrinking. An expanded grant program would address two needs. 1) A Watershed Council coordinator to support local watershed group functions, help develop local grant proposals and projects and administer non-point grants in the area, therefore freeing up the WQMA lead for other work. 2) Provide grant dollars to help support current and future watershed oriented efforts to assess resources, explore options and locally determine preferred outcomes and tools to reach those outcomes, implement restoration projects and address expanded educational objectives.
Partners: EPA, WDFW, DCTED, DNR, Conservation Districts
Contact: Dave Howard, (360) 407-6298

Title: Forest Watershed Analysis of Targeted Basins for Restoration and Protection (ECY-254)
Relevant Factor(s) for Decline: All Six
Description: For steelhead drainages where forestry is the primary land use, Ecology, DNR, WDFW, US Forest Service and landowners accomplish state and/or federal watershed analyses to identify key habitat issues and watershed processes affecting or protecting habitat. Implement restoration measures identified, including road maintenance and restoration. Significant watershed scale road, hillslope and riparian restoration efforts are expected to need grant supplements. Monitor implementation and effectiveness of measures at maintaining and restoring steelhead habitat. All work should be done in a manner that will meet federal Clean Water Act and Washington State guidance for TMDLs.
A majority of wild steelhead habitat within the LCSCI area is found within the managed forest landscape. Because this area has no active tribal interests that have contributed to the body of knowledge on the extent and condition of fish habitat, current data has more gaps than in some other regions of the state. Existing and new information as it is gathered and analyzed will need to be evaluated and prioritized to determine sequencing for watershed analysis based work in support of steelhead recovery.
Need for this work was identified during the Lower Columbia WQMA scoping in the Grays, Elochoman, Germany and Abernathy drainages (as well as smaller nearby drainages). Scoping in the Columbia Gorge WQMA in the fall of 1998 will prioritize basins in that area. Possible basins are the Kalama, East Fork Lewis, Washougal and Wind Rivers. Work should at least include water quality monitoring, forest road inventories and riparian zone assessments to be accomplished and results from the inventories to be prioritized, implemented and monitored.
Partners: DNR, WDFW, USFS, Forest land owners, local interest groups
Contact: Joanne Schuett-Hames, (360)407-6296 and Mark Bentley, (360) 407-7269

Title: Barrier, Culverts and Stream Retyping (ECY-255)

Relevant Factor(s) for Decline: Impaired Water Quality, Sediment Transport and Fine Sediment, Riparian Areas and Wetlands Degradation, Fish Access and Barriers

Description: This work is a joint effort by Ecology, DNR, WDFW, USFS, local jurisdictions and Conservation Districts to inventory and rectify human caused barriers to fish habitat and to watershed processes which affect fish habitat. In addition, a key focus of this work is to assure waters with fish are correctly typed to provide adequate protection measures during land use permitting decisions and for forest practice implementation. This assistance for both components will be key for resource protection, but also facilitate permitting processes by providing accurate information to land managers and regulators. Education and technical assistance for evaluation of barriers and solutions to barriers will be provided as will field evaluation of streams for the presence of fish to properly type them under the Forest Practice Regulations. Subsequent map corrections will be accomplished to reflect actual stream type.

Partners: Local habitat improvement groups, landowners and others noted above.

Contact: Charles Toal, (360) 407-6299.

Title: Timber Fish and Wildlife Technical Assistance (ECY-256)

Relevant Factor(s) for Decline: Impaired Water Quality, Sediment Transport and Fine Sediment, Riparian Areas and Wetlands Degradation, Fish Access and Barriers

Description: Establish a Timber Fish and Wildlife field position for the Vancouver Office to cover the Columbia Gorge WQMA and portions of the lower Columbia WQMA within the conservation initiative area. This position will promote forest land stewardship for water quality, provide technical assistance and education for small and larger landowners, compliance where necessary, and coordination of forest management activities on state and private lands. This would also provide the ability to effectively work with development of restoration projects and review of forest land components of FERC relicensing projects on the Lewis and Cowlitz Rivers.

Partners: DNR, WDFW, USFS, Conservation Districts, County Planning, Landowners.

Contact: Mark Bentley, (360) 407-7269

Title: Assess Problem of and Solutions to Abandoned Farms (ECY-257)

Relevant Factors for Decline: Impaired Water Quality, Riparian Areas and Wetlands Degradation

Description: A number of abandoned dairy farms exist in the area with large manure Lagoons. They pose a threat from catastrophic failure that could send a torrent of manure waste into adjacent waterways. Some fish and other aquatic life would be killed outright and deposits of waste could cause longer term damage to riparian and spawning areas and normal nutrient cycling in the stream system. Clark Co. in 1996, spent public monies to shore up one such lagoon in the Salmon

Creek basin that had begun to breach. The NRCS has done some work on a protocol for decommissioning manure lagoons. Additional effort is needed to inventory the problem in the area (currently estimated at over 10 farms) and work with landowners to develop farm plan closures and eliminate the potential threat of abandoned or unneeded lagoons.
Partners: NRCS, Conservation Districts, Counties and land owners.
Contact: Marilou Pivirotto, (360) 407-6283

Agency: Department of Ecology/Water Resources Program

Phase 1 Actions.

Title: Watershed Assessment (WRIA 28 only) (ECY-176)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Continue to support and provide technical assistance to Clark County and Clark Public Utilities in their efforts to monitor streams, collect data, and assess water availability in parts of WRIA 28 (Salmon-Washougal). Specific information is currently not readily available documenting the effect of existing water uses on the availability of water for salmonids in WRIA 28. The streams in the area are managed primarily to protect instream flows recommended by the Department of Fish and Wildlife. This level of effort is consistent with the currently planned resource deployment of one FTE to the Clark County area, located in Ecology's Vancouver office.
Contact: Michael Harris, 360 407-6389.

Phase 2 Actions

Title: Watershed Assessments (ECY-276)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Carry out an assessment of the water situation in each fish producing stream in WRIAs 25 (Grays-Elochoman), 26 (Cowlitz), 27 (Lewis), 28 (Salmon/Washougal) and 29 (Wind-White Salmon). Determine whether instream flows are now or could become a factor limiting production of fish. Specific information is currently not readily available documenting the effect of existing water uses on the availability of water for salmonids in Lower Columbia ESU tributaries. Assessments would pull together existing information on surface and ground water supplies, water rights, growth patterns, and instream flow needs. They would identify data gaps and provide a basis on which to determine whether instream flows are or could become a factor limiting the production of steelhead and other salmonids in individual streams in the ESU.
Contact: Michael Harris, 360 407-6389.
Title: Instream Flow Priorities (ECY-277)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Determine priority streams for establishing flows within ESU 4 based on immediacy of the threat to steelhead and other salmonids. Some factors to

consider include population growth and economic development expectations within each watershed, the current status of fisheries, and available information.
Contact: Brad Caldwell, 360 407-6639.

Title: Withhold Action on Water Rights (ECY-278)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: During the process of determining and adopting instream flows, it may be necessary to withhold action on pending and new water right applications until the flows are established. Ecology can formally withdraw a water body from appropriation by rule if it will require a year or more to determine or adopt instream flows, or if it will require less than one year, Ecology can informally withhold action on water right applications.
Contact: Ken Slattery, 360 407-6603

Title: Determine Instream Flow Needs (ECY-279)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Carry out instream flow studies on priority streams and river segments in ESU 4 using methods agreed upon by Ecology and Fish and Wildlife. Based on results, consult with fish and wildlife agencies and other interested parties on flow needs. Cooperate with the Federal Energy Regulatory Commission on any instream flow studies required in connection with relicensing the Cowlitz River hydroelectric projects.
Contact: Brad Caldwell, 360 407-6639.

Title: Adopt Instream Flows (ECY-280)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Adopt instream flows and/or stream closures by administrative rule through a public process in connection with a local watershed plan, if any, or if no such plan is under development, on Ecology's own initiative. The rule may also need to address the control of new wells exempt from permitting requirements where such wells would be withdrawing water in significant hydraulic continuity with a stream or other protected surface water body.
Contact: Ken Slattery, 360 407-6603.

Title: Condition/Deny Water Rights and Water Quality Certifications (ECY-281)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Once adopted, instream flows are water rights that are superior in priority to subsequently developed water uses. Ecology is required by law to condition any new permits with the instream flows. If a stream is closed to appropriation, Ecology must deny any subsequent application for consumptive use (i.e. a water use that would diminish the source). In addition, Ecology would advocate the adopted instream flow protection measures with regard to any new development projects requiring a federal permit that would require a state water quality certification under section 401 of the federal Clean Water Act.
Contact: Michael Harris, 360 407-6389.

Title: Establish or Upgrade Streamflow Monitoring (ECY-282)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Continuous recording gauging stations should be established on all major rivers in the ESU that are lacking them now. Several of these gauging stations should be designated as indicator stations and should be telemetered (i.e. equipped with real time reporting hardware) so that flows can be monitored constantly. Small streams with adopted instream flows should at a minimum be equipped with staff gauges that can be monitored manually during low flow periods.
Contact: Ken Slattery, 360 407-6603.

Title: Assuring Compliance (ECY-283)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Regulate conditioned water rights when instream flows are not being met. Take enforcement action against illegal and excessive water diversions and withdrawals. Take relinquishment action against former water rights that have been unused for five or more years without good cause.
Contact: Michael Harris, 360 407-6389.

Title: Acquire Trust Water Rights (ECY-284)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Prioritize streams for acquisition of water rights based on instream flow goals and the frequency and severity of shortfalls in meeting instream flow goals. Seek Legislative appropriation of funds for acquiring water rights if any are found to be available. Acquire existing water rights by purchase, lease, receipt of gift or water conservation funding for dedication as trust water rights. To the extent possible, cost share acquisition with federal funds and private foundation funds. This requires funding and explicit spending authority for this purpose from the state Legislature.
Contact: Ken Slattery, 360 407-6603.

Title: Water Use Quantity Standards (ECY-285)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: State water rights are based on beneficial use. Water that is wasted is not part of a water right. Furthermore, appropriators are expected to improve their efficiency of use over time as the available technology and local customary practices improve. One means of assuring that water is not wasted is to establish and enforce water use standards for domestic, irrigation and other appropriate water uses. Water use standards should ideally be determined as part of a watershed planning project for ESU 4, but may be established by Ecology if no planning is undertaken.
Contact: Ken Slattery, 360 407-6603.

Title: Measuring Devices (ECY-286)

Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Effective water management is not possible without the capability to measure the diversion and use of water. State law requires metering as a condition of all new surface water permits. Metering may be required by Ecology of existing water rights where the diversion is from waters in which salmonid stock status is depressed or critical as determined by the Department of Fish and Wildlife or where the volume diverted exceeds one cubic foot per second. Ecology now routinely requires metering on new water right permits but lacks sufficient resources to check on compliance, require reporting, store data in a usable and retrievable form, or to require the retrofitting of measuring devices and reporting by existing uses.
Contact: Fred Rajala, 360 407-6634.

Title: Low Water Use Landscaping (ECY-287)
Relevant Factor(s) for Decline: Basin Hydrology and Stream Flow
Description: Landscape irrigation during summer typically doubles the quantity of water that is required for domestic use during the winter. This requires water systems to be sized to meet peak summer use demands, and exacerbates the amount of water that is diverted during the summer low flow period. Landscaping codes adopted by local governments could significantly reduce peak summer water demand. These codes either limit the irrigated area or require use of low water using vegetation types. Ecology could assist by developing a model ordinance to be used by local governments. Municipal water utilities can also offer financial incentives to reduce landscape irrigation, including appropriate rate structures and subsidies for converting to low water use landscapes. Technical assistance could be sought from the University of Washington or Washington State University, both of which have programs promoting low water use landscaping.
Contact: Ken Slattery, 360 407-6603.

Agency: Washington Department of Fish and Wildlife

Phase 1 Actions

Title: WRIP Process (DFW-101)
Relevant Factors for Decline: All six factors.
Description: The Watershed Recovery Inventory Project (WRIP) will identify priority riparian and wetland habitats in need of preservation and restoration in the LCSCI area. This project permits large scale and rapid assessments within watersheds. This project was initiated in 1997.
Partners: Although developed within WDFW, regional involvement of the USFS, Ecology, DNR, and local governments or watershed councils will be encouraged.
Contact: Greg Hueckel (360) 902-2416

Title: Centralized Database for Fish Barriers (DFW-102)
Relevant Factor for Decline: Fish Access and Barriers to Passage

Description: WDFW maintains a database called "Unresolved fish passage problems " which documents barriers reported by various sources. Approximately 68 barriers to salmon are recorded for roads in the WRIAs comprising the study area. This includes 20 on the state highways. The level of information for these records is variable, some have adequate information to prioritize, others will require assessment by WSDOT and WDFW to determine if correction is needed.
Contact: Paul Sekulich (360) 902-2527; Paul Wagner, WSDOT (360) 705-7406

Title: Coordinated GIS Efforts. (DFW-103)
Relevant Factors for Decline: All six factors.
Description: WDFW will coordinate with Ecology, DNR, and other GIS possessing entities to facilitate data interchange that speeds information sharing related to steelhead recovery. WDFW currently has and will maintain a free information sharing policy on fish and fish habitat data to guide policy decisions in state and local governments.
Partners: Ecology, DNR, local governments and management entities.
Contact: Martin Hudson (360) 902-2487

Title: Informational Materials. (DFW-104)
Relevant Factors for Decline: All six factors.
Description: WDFW will develop informational materials on the life history characteristics and requirements of salmonid fishes, relating land management influences to fish habitat. WDFW will work closely with state and local governments in development and distribution of educational material to diverse citizen audiences. WDFW will distribute these materials to all Hydraulic permit applicants and encourage county governments to distribute to Shoreline permit applicants. WDFW will work closely with DNR to develop a co-produced brochure with similar goals to be provided with all Forest Practice Applications.
Partners: DNR, Ecology, CTED, DOA, NRCS, DOH, WSDOT, and county governments.
Contact: Sandi Snell (360) 902-2229

Title: Community Events (DFW-105)
Relevant Factors for Decline: All six factors.
Description: WDFW will participate in local water festivals, and community events and fairs to motivate and educate citizens in preservation/restoration activities that enhance steelhead populations. WDFW will work closely with local watershed councils and volunteer restoration groups to coordinate presentations and displays. WDFW will incorporate educational and outreach discussions with interested organizations into regional work plans to the extent of 0.5 FTEs.
Partners: Watershed councils and volunteer restoration groups.
Contact: Lee Van Tussenbrook (360) 906-6704

Title: Volunteer Restoration Group Assistance/Technical Assistance (DFW-106)
Relevant Factors for Decline: All six factors.

Description: WDFW will extend expertise and interagency facilitation to local restoration groups and incorporate these activities into regional work plans. In cooperation with watershed councils, and state and local agencies, WDFW will provide restoration priorities and expertise in planning, bioengineering, and basin-wide assessments and ecosystem perspectives to restoration groups. WDFW currently dedicates about 1 FTE for volunteer restoration efforts in the LCSCI area. Using existing resources, WDFW will commit 2 additional FTEs for volunteer restoration activities for a total of 3 FTEs within the LCSCI area.
Partners: Ecology, CTED, DOA, DNR, NRCS, and local governments, watershed councils, and restoration groups.
Contact: Lee Van Tussenbrook (360) 906-6704

Title: Prioritize WDFW Land Ownership (DFW-107)
Relevant Factors for Decline: All six factors.
Description: WDFW will prioritize parcels owned or managed by WDFW. WDFW will sell or trade less desirable land, and acquire land to benefit steelhead and other salmonids on a priority basis to the extent permissible by law. WDFW will manage currently owned and desirable parcels to benefit steelhead and other salmonids. WDFW will utilize volunteer restoration groups to the extent possible to create model land stewardship.
Partners: Volunteer restoration groups
Contact: Ray Crosswell (360) 906-6721

Title: Acquisition (DFW-108)
Relevant Factors for Decline: All six factors.
Description: Coordinating with Ecology and local jurisdictions, WDFW will identify and prioritize high quality wetland and riparian habitat for acquisition. WDFW will consider fee title, development rights, and conservation easements as well as outright purchase when coordinating with county governments on land acquisition to benefit steelhead.
Partners: County governments, Ecology
Contact: Ray Crosswell (360) 906-6721

Title: Mitigation (DFW-109)
Relevant Factors for Decline: All six factors.
Description: WDFW will require mitigation that benefits steelhead habitat when all violations of the state Hydraulics code are encountered. WDFW will require that adverse deviations of state hydraulic permits be immediately restored to permit requirements or when least harmful to steelhead.
Contact: Bryan Cowan (360) 906-6720

Title: Grants (DFW-110)
Relevant Factors for Decline: All six factors.
Description: WDFW will commit 0.2 FTEs toward grant writing and soliciting regional monies to benefit steelhead and other salmonids. WDFW will partner with local groups to utilize grants for habitat restoration, conservation easements,

and acquisition. Currently no FTEs are committed to grant proposals.
Partners: Ecology, local governments, volunteer restoration groups
Contact: Bryan Cowan (360) 906-6720

Title: Root Wads and Willows Seminars (DFW-111)
Relevant Factors for Decline: All six factors.
Description: WDFW will hold annual workshops on bioengineering, culvert design and criteria, habitat restoration, and road maintenance, construction and decommissioning. Engineering staff will hold these workshops for WDFW employees and will be available to the general public. WDFW will partner with state and federal agencies as well as local groups with expertise to present the workshops.
Partners: Ecology, DNR, USFS, WSDOT, local governments, and volunteer restoration groups
Contact: Michelle Horn (360) 902-2610 and Bryan Cowan (360) 906-6720

Title: Levees (DFW-112)
Relevant Factors for Decline: All six factors.
Description: WDFW will work cooperatively with Ecology to identify where levees can be removed or set back away from the active channel to increase riparian habitat and increase floodplain interaction. WDFW will work cooperatively with Ecology on the establishment of state standards for levee vegetation that do not compromise levee integrity. WDFW will provide engineering and planning expertise to minimize adverse impacts to steelhead when removing or moving levees.
Partners: Ecology, local governments
Contact: Bryan Cowan (360) 906-6720, Millard Deusen (360) 902-2562

Title: Gravel Mining (DFW-113)
Relevant Factors for Decline: All six factors.
Description: WDFW will, with county government support, request a moratorium on future floodplain gravel extraction. Clark county has already implemented such a measure which may serve as a model for other counties within the LCSCI area. On mining operations already existing, WDFW will work cooperatively and proactively with operators to limit expansion, reduce adverse effects, mitigate damage to stream systems and, once operations have ceased, retire the mining site in a manner conducive to ecosystem health.
Partners: Ecology, local governments, gravel mining operators
Contact: Bryan Cowan (360) 906-6720

Title: Road Assistance (DFW-114)
Relevant Factors for Decline: All six factors.
Description: WDFW will assist road management entities when requested with planning and expertise to minimize road density within watersheds, fine sediment delivery to the channel, potential mass wasting on sensitive slopes, and floodplain

damage.
Partners: WSDOT, DNR, local governments, and commercial interests
Contact: Bryan Cowan (360) 906-6720

Title: Fish Passage Barriers. (DFW-115)
Relevant Factors for Decline: Fish Access and Barriers to Passage.
Description: WDFW will assist WSDOT in the assembling of data related to fish passage in the LCSCI area. WDFW will assist WSDOT in informing responsible parties of the barriers and work cooperatively to repair or replace them as necessary. WDFW will make available informational materials that stipulate conditions for adequate fish passage to minimize future passage problems.
Partners: WSDOT, DNR, local governments, and commercial interests
Contact: Tom Burns (360) 902-2558, Larry Cowan (360) 902-2557, and Bryan Cowan (360) 906-6720

Title: Enforcement (DFW-116)
Relevant Factors for Decline: All six factors.
Description: WDFW will formally request strict enforcement of Forest Practice rules by DNR, of Shoreline permit restrictions, floodplain restrictions, and the Conversion law by county governments, and wetland laws by Ecology especially as they relate to the protection of steelhead. Washington has many laws that, if enforced, would greatly enhance steelhead survival.
Partners: Ecology, DNR, local governments, and private and commercial interests
Contact: Bryan Cowan (360) 906-6720

Title: GMA/SMA. (DFW-117)
Relevant Factors for Decline: All six factors.
Description: WDFW will work closely with county governments and the general public to incorporate steelhead and salmonid protection measures in Growth Management Act and Shoreline Management Act restrictions. Clark County has recently developed a model Habitat Conservation Ordinance that WDFW will use to encourage other counties.
Partners: County governments, Ecology, interested citizens
Contact: Bryan Cowan (360) 906-6720 and Steve Manlow (360) 260-6383

Title: Streambank and Channel Stabilization Guidance (DFW-117)
Relevant Factor(s) for Decline: All six factors
Description: DFW is preparing, through internal symposia staffed by regional habitat biologists, a guidance document to serve field staff when projects for stream modifications are proposed. This guidance incorporates discussion of stream processes, watershed analysis to determine mechanisms of failure, channel stabilization techniques appropriate to address various failure mechanisms, and implications that the techniques have for fish habitat values. This document will serve DFW staff statewide. Other key partners include Ecology, WSDOT, plus,

federal, tribal, local government staff with expertise in fishery resource and/or channel and hydraulic processes.
Contact: Ken Bates (360) 902-2545; Michelle Horne (360) 902-261

Phase 2 Actions

Title: Watershed Assessment/Analysis (DFW-201)
Relevant Factors for Decline: Riparian areas and Wetland Degradation, Decreased Channel and Floodplain Complexity, and Fish Access and Barriers to Passage.
Description: Riparian and in-stream habitat inventories have been developed and initiated within the LCSCI area. A total of 966 linear miles of riparian habitat have been inventoried within the Lewis/Kalama Watersheds. In-stream surveys will begin in June 1998. To date, data collection have been focused in the Lewis and Kalama basins. With additional funding for technical staff, this effort will increase in the watershed and extend to other basins within the LCSCI area using 4 new bio technicians. The assessment permits fine-grained analysis of riparian and in-stream habitat, affording greater spatial detail than WRIP assessments. Surveys were developed to nest within TFW (level 2) watershed analyses, and are compatible with USFS data collection efforts.
Partners: USFS, LCFEG, and regional volunteer groups.
Contact: David Price (360) 906-6729

Title: Enhanced GIS Efforts. (DFW-202)
Relevant Factors for Decline: All six factors.
Description: Dependent on additional funding, WDFW will expand mapping products associated with spatial data collected under the WRIP and Watershed Analyses projects.
Contacts: David Price (360) 906-6729; Mark Hunter (360) 902-2542

Title: Community Events. (DFW-203)
Relevant Factors for Decline: All six factors.
Description: With additional funding, WDFW will hire an additional full time biologist for education and outreach. Educational efforts that increase public awareness may be the largest single factor leading to changes in land management activities that have imperiled steelhead and other salmonids. An additional biologist within the region will permit 1.5 FTEs to be devoted to education and outreach programs.
Partners: Watershed councils and volunteer restoration groups.
Contact: Bryan Cowan (360) 906-6720

Title: Volunteer Restoration Group Assistance/Technical Assistance (DFW-204)
Relevant Factors for Decline: All six factors.
Description: With additional staff resources, WDFW would deploy 2 additional FTEs for stream restoration/preservation activities, for a total of 5 FTEs in the LCSCI area.

Volunteer restoration groups have increased recently in the region and are expected to greatly increase in the near future. In cooperation with watershed councils, and state and local agencies, WDFW will provide restoration priorities and expertise in planning, bioengineering, and basin-wide assessments and ecosystem perspectives to restoration groups. Currently, only 1.0 FTE is allocated to assist restoration groups in the LCSCI area, and 2.0 additional FTEs will be deployed using existing staff

Partners: Volunteer restoration groups
Contact: Lee Van Tussenbrook (360) 906-6704, Bryan Cowan (360) 906-6720

Title: Enhanced WDFW-Owned Land (DFW-205)
Relevant Factors for Decline: All six factors.
Description: With additional funds, WDFW will repair existing degraded WDFW property, and enhance public awareness of the benefits of riparian and wetland habitat to salmonids through the use of signs and other enhancements.
Partners: Volunteer restoration groups
Contact: Ray Crosswell (360) 906-6721

Title: Acquisition (DFW-206)
Relevant Factors for Decline: All six factors.
Description: WDFW will solicit the legislature to fund acquisition projects on a yearly basis (currently biennial) and with greater funding levels to protect or enhance steelhead populations.
Contact: Ray Croswell (360) 906-6721, Lee Van Tussenbrook (360) 906-6704

Title: Grants (DFW-207)
Relevant Factors for Decline: All six factors.
Description: Using additional funding, WDFW will hire an additional biologist or grant writer full time to acquire funds for regional steelhead restoration projects, and easements or acquisitions. Regional support for acquiring grants would amount to 1.2 FTEs within the LCSCI area (0.2FTE's using existing staff).
.**Partners:** Ecology, local governments, volunteer restoration groups
Contact: Bryan Cowan (360) 906-6720

Title: Habitat Monitoring (DFW-208)
Relevant Factors for Decline: All six factors.
Description: See monitoring chapter
Partners: Ecology, DNR, NRCS, USFS, LCFEG, local governments, and commercial industries
Contact: Greg Volkhardt (360) 902-2779 and David Price (360)576-6077

Title: Restoration Grants (DFW-209)
Relevant Factors for Decline: All six factors.
Description: WDFW will solicit the state legislature to provide necessary funds for habitat restoration projects. Funds might be distributed to restoration groups jointly by the department of Fish and Wildlife and Ecology in the form of grant awards. Grants awards would be weighted on criteria established by WDFW and Ecology.
Partners: Ecology, NRCS, USFS, County governments, and volunteer restoration groups.
Contact: Lee Van Tussenbrook (360) 906-6704 and Bryan Cowan (360) 906-6720

Title: Statewide Stream Corridor Guidance Document (DFW-210)
Relevant Factor(s) for Decline: All six factors
Description: DFW is working cooperatively with Ecology, DNR and WSDOT to resolve conflicts between the regulatory and proprietary agencies regarding channel modification projects. With existing resources, the agencies are contributing to host a technical symposium on channel processes and channel modification techniques, then provide input to the DFW guidance document in order to create a statewide guidance document endorsed by DFW, Ecology, and DNR. If needed resources are provided, this would be followed by workshops and training for both the regulatory and design communities, such as county public works, WSDOT, flood control districts, etc.
Contact: Ken Bates (360) 902-2545, DFW; Doug Canning (360) 407-6781, Ecology

Agency: Interagency Committee for Outdoor Recreation (IAC)

Phase 1 Actions

Title: Washington Wildlife and Recreation Program (IAC-101)
Relevant Factor(s) for Decline: Riparian Areas and Wetland Degradation
Description: The Washington Wildlife and Recreation Program (WWRP) provides funding to tribes, counties, cities and other local agencies for protection of wildlife habitat through acquisition of habitat land. Over the seven-year history of the program grants have been provided to acquire riparian habitat along the Lewis and Columbia rivers and on Vancouver Lake. In the 1997-99 biennium, a total of $22.5 million was made available to IAC to fund acquisition of all types of habitat land, state-wide.

Contact: Jim Fox (360) 902-3021

Title: Riparian Habitat Program (IAC-102)
Relevant Factor(s) for Decline: Riparian Areas and Wetland Degradation
Description: The Riparian Habitat Program, created by the Legislature in 1997, provides funding to counties, cities, conservation districts, land trusts, and "nature conservancy" organizations for protection of riparian habitat through acquisition of less-than-fee property interests. Funding is also provided for restoration and enhancement projects on those properties. A total of $4 million is available for this pilot program. Applications are due November 12, 1997. Competitive evaluation of grant applications will be done in January and grants awarded in February, 1998. There have been inquires from organizations in the Lower Columbia ESU.
Contact: Jim Fox (360) 902-3021

Phase 2 Actions

Title: Washington Wildlife and Recreation Program (IAC-201)
Relevant Factor(s) for Decline: Riparian Areas and Wetland Degradation
Description: The Washington Wildlife and Recreation Program (WWRP), which provides funding to tribes, counties, cities and other local agencies for protection of wildlife habitat through acquisition of habitat land, will be seeking continued funding in the 1999-2001 Capital Budget.
Contact: Jim Fox (360) 902-3021

Title: Riparian Habitat Program (IAC-202)
Relevant Factor(s) for Decline: Riparian Areas and Wetland Degradation
Description: The Riparian Habitat Program, created by the Legislature in 1997 to provide funding for less-than-fee acquisition of riparian habitat land and restoration and enhancement projects on that land, will report to the 1999 Legislature on the program's need and effectiveness. The Legislature will decide on continuation of the program and its funding.
Contact: Jim Fox (360) 902-3021

Agency: Department of Natural Resources

Phase 1 Actions

Title: Assisting Oil Spill Clean-up (DNR-101)
Factor for Decline: Impaired Water Quality
Description: Aid the clean-up of contaminated urban bays and restoration of damaged habitats by aiding in the clean-up from oil spills.
Contact: Bill Graeber, Aquatics Division

Title: Review of Gravel Removal (DNR-102)
Factor(s) for Decline: All
Description: Conduct environmental review for gravel removal and dredging happening in both rural and urban areas.
Contact: Bill Graeber, Aquatics Division

Title: Water Withdrawals and Impaired Function (DNR-103)
Factor(s) for Decline: Impaired Water Quality, Basin Hydrology and Stream Flow
Description: In both urban and rural areas, DNR is identifying freshwater, estuarine and marine areas where functions have been impaired by water withdrawals. We are also working with local government agencies to restore/mitigate for lost function.
Contact: Bill Graeber, Aquatics Division

Title: Implement 1309 Standards (DNR-104)
Factors for Decline: Impaired Water Quality; Sediment Transport and Fine Sediments; Decreased Channel and Floodplain Complexity; Riparian Areas and Wetlands Degradation.
Description: House Bill 1309 ecosystem standards are intended to maintain and restore fish and wildlife habitat by improving ecosystem health on agricultural land, rangeland, and grazeable woodland managed by the DFW and DNR. The ecosystem standards are goals the land manager should be working toward. DNR has implemented HB 1309 on two blocks of land (one 80 acres, the other 160 acres) within the study area; and plans to complete implementation on an additional 15 rural agricultural blocks within the next 4 years.
Contact: Loren Stern; Agriculture Division

Title: Habitat Conservation Plan (DNR-105)
Relevant Factors for Decline: All
Description: The HCP addresses long-term habitat needs of fish and wildlife species on state trust lands, including stocks of salmon and steelhead. Implementation has begun and will be complete by January 1, 1999. Results will be realized incrementally and increase progressively each year. Counties and parts of counties with HCP lands that are located in or adjacent to ESU 4 include eastern Lewis, southeast Pacific, Wahkiakum, Cowlitz, Clark and Skamania. Major rivers on HCP lands in the Columbia planning unit include the Cowlitz, Toutle, Coweeman, Kalama, Lewis, Washougal, Wind and Grays. Acreage for the HCP Columbia planning unit: 286,000. Key partners include the USF&W and NMFS.
Contacts: Chuck Turley, Forest Resources division; Steve Landino, NMFS

Title: Watershed Analysis (DNR-106)
Relevant Factors for Decline: All
Description: A biological and physical assessment of a watershed which addresses the cumulative effects of forest practices on specific public resources. Based upon

the assessment, prescriptions are designed to protect and allow the recovery of public resources (fish, water and capital improvements). These prescriptions become requirements for forest practices applications approved by the DNR. There are several completed watershed analyses in or close to the study area. They include the following:

> Elochoman, completed in 1995; primary landowners, DNR and Cavenham
> Chehalis, completed in 1994; primary landowner Weyerhaeuser
> Stillman, completed in 1994; primary landowner Weyerhaeuser
> Willapa, completed in 1994; primary landowner Weyerhaeuser

Another watershed analysis which is in the prescription process and nearing completion is the Upper Coweeman. It is located on private land (Weyerhaeuser is the primary landowner) and covers approximately 45,000 acres. Major tributaries include Baird, Mullohand, 19, Butler, O'Neil, and Skipper Creek. This watershed analysis is in the prescription phase and will be undergoing SEPA review. Implementation begins as soon as prescriptions are drafted and is currently underway.

The TFW partners are in the midst of negotiations which will result in modifications to the WSA model. Tentative topics to be negotiated include: forest roads, riparian management, upland harvest, watershed analysis improvements, restoration, monitoring and research. NMFS is participating in these negotiations. Contact Steve Bernath (DNR) or Steve Landino (NMFS) for more information on the TFW process.

Partner: Weyerhaeuser
Contact: Nancy Sturhan, Forest Practices Division

Title: Jobs for the Environment Program (DNR-107)
Relevant Factor(s) for Decline: All
Description: The Jobs for the Environment program has provided several million dollars for projects to improve streams and streamside habitat. Recent projects in ESU 4 include a forest road abandonment performed by the SW Region of DNR on Beavalo Creek, a tributary in the Elochoman River Watershed. A second project was completed on Simmons Creek, a tributary of the White Salmon River. This project, on forest land also managed for grazing, involved fencing of riparian areas to improve stream bank integrity, riparian vegetation, and reduce sedimentation, as well as stabilize the headwaters of an incising stream.

One of the twenty-two proposals from JFE's Round One competitive grant process is for the Wind River (just east of Stevenson, WA). This proposal was submitted from Washington Trout to conduct stream typing in the amount of $70,000. Applications for Round One are currently in the evaluation process. Notices of awards should be announced by January of 1998.

Contact: Project manager for the forest road abandonment project, Tammy Yeakey (509) 925-8510; for Beavalo Creek project, Stan Ross, (360) 577-2025.

Title: Landscape Plans (DNR-108)

Relevant Factor for Decline: All
Description: DNR uses landscape planning on selected blocks of land; the plans focus on operational decisions for good stewardship of state forests. In the study area, there is a landscape plan on the Elochoman Forest (33,758 acres near Cathlamet on the Columbia River). The plan is going through the final review process at this time; publication is expected in December 1997.
Several components of this landscape plan go beyond the requirements of the HCP. First, hydrologic basins that were areas of concern were identified in a review process. The plan will thus call for retaining half of the trees within those basins at an age class of 25 plus years of age. Secondly, while current stream channel health in the Elochoman is very good, future failings were identified within the riparian areas as not having sufficient potential large woody debris. The landscape plan includes directions to create better LWD in the future. This will be incorporated under HCP guidelines but targeting of those identified areas within the Elochoman will occur now. And finally, areas of unstable soils were identified. The landscape plan calls for different approaches for road construction and harvesting techniques of those marginal areas to minimize impacts to the unstable soils. Elochoman biological assessment findings are being implemented, HCP enhancements are implemented per HCP guidelines.
Contact: Rick Cooper, SW Region, 360-902-1117

Title: Forest Road Abandonment (DNR-109)
Relevant Factor for Decline: Impaired Water Quality; Sediment Transport and Fine
Sediments; Basin Hydrology and Stream Flow; Decreased Channel and Floodplain Complexity; Fish Access and Barriers to Passage.
Description: DNR continues to upgrade the state forest road system to meet forest practice standards. DNR southwest region has two major road abandonment projects, one on the Elochoman and Grays Rivers, and another covering 70 miles on the Toutle River.
Contact: Ann Johnson, SW Region

Agency : Washington State Department of Transportation

Phase 1 Actions

Title: State Highway Fish Passage Inventory (DOT-101)
Relevant Factor(s) for Decline: Fish Access and Barriers to Passage
Description: At present all culverts in the state highway system have been inventoried, many have had additional survey data collected and have been prioritized for correction. Inventory data indicates at least 20 barriers to salmon on highways for which WSDOT is responsible in the LCSCI area. These barriers are being corrected as encountered during regular highway projects. Other high priority barriers are being corrected in "stand alone" efforts.
Contact: Paul Wagner (360) 705-7406

Title: Fish Passage Task Force (DOT-102)
Relevant Factor for Decline: Barriers to Fish Passage
Description: The Fish Passage Task Force was formed by legislation (SB 5886) which directed WSDOT and WDFW to convene and co-chair a group which would address expansion of existing fish passage programs. This group will submit recommendations to the legislature in December 1997.
Contact: Paul Wagner (360) 705-7406 and Paul Sekulich (360) 902-2527

Title: Erosion and Sediment Control Training (DOT-103)
Relevant Factors for Decline: All six factors.
Description: WSDOT provides certification in Construction Site Erosion and Sediment Control. Training is provided to prime contractors, WSDOT inspectors, and local agency personnel responsible for constructing or inspecting projects that contain wetlands, sensitive area, and/or large areas of disturbed earth.
Contact: David S. Jenkins, Erosion Control Coordinator, (360) 705-7479

Title: Fish Passage Research (DOT-104)
Relevant factor for Decline: Barriers to Fish Passage
Description: WSDOT is sponsoring research projects to evaluate the passage needs of juvenile salmonids especially coho and steelhead which have extended instream juvenile residence time. Research will address the design criteria for culverts to ensure access to necessary habitat is provided at all for life stages.
Contact; Paul Wagner, WSDOT Fish Passage, Program Manager (360) 705-7406

Title: Erosion and Spill Control Lead (DOT-105)
Relevant Factors for Decline: All six factors.
Description: WSDOT requires that prime contractors working on certain DOT projects have an ESC Lead available that has been certified by taking the WSDOT Construction Site Erosion and Spill Control Course. The ESC Lead is called out in contracts for projects that contain wetlands, sensitive areas, and/or large areas of disturbed earth.
Contact: David S. Jenkins, Erosion Control Coordinator, (360) 705-7479

Title: Water Quality Experimental Stations (DOT-106)
Relevant Factors for Decline: All six factors.
Description: WSDOT operates two water quality experimental stations, one near Wenatchee, the other at Black Hills west of Olympia. These sites are used to investigate ways to improve erosion control practices, products, and methodologies as well as test new products.
Contact: David S. Jenkins, Erosion Control Coordinator, (360) 705-7479

Title: New Product Evaluation Committee (DOT-107)
Relevant Factors for Decline: All six factors.
Description: WSDOT reviews products for use on projects. All products are evaluated to determine potential harm to salmonids and the environment. Product types include erosion and sediment control devices and construction-related chemicals.
Contact: David S. Jenkins, Erosion Control Coordinator, (360) 705-7479

Title: Standard Plans and Specifications Updates (DOT-108)
Relevant Factors for Decline: All six factors.
Description: WSDOT continually revises plans, specifications, and estimates to reflect current technology and to improve contractual compliance.
Contact: David S. Jenkins, Erosion Control Coordinator, (360) 705-7479

Title: Erosion Control Outreach (DOT-109)
Relevant Factors for Decline: All six factors.
Description: WSDOT maintains a water quality web site in order to provide information on topics including erosion and sediment control. This provides a means to share the latest technology and methods to a wide audience.
Contact: David S. Jenkins, Erosion Control Coordinator, (360) 705-7479

Title: Stormwater BMP Monitoring & Research (DOT-110
Relevant Factors for Decline: All six factors.
Description: WSDOT's NPDES stormwater management program has committed to monitor new and innovative stormwater BMP technologies for water quality treatment. WSDOT has also entered an agreement with ASCE/CERF to jointly verify stormwater treatment technologies. Currently, WSDOT has 4 BMP monitoring locations in operation with 6 more waiting for completion of construction projects.
Contact: Ed Molash, Water Quality Program (360) 705-7507

Title: Stormwater BMP Design Optimization (DOT-111)
Relevant Factors for Decline: All six factors.
Description: In accordance with WAC 173-270-030(1), WSDOT has developed the Highway Runoff Manual, which contains design protocols for low maintenance, mechanically simple, gravity driven highway stormwater treatment systems. Detailed BMP design specifications will be developed from WSDOT-conducted and nation-wide stormwater BMP research and monitoring studies that results in the improvement of toxicant removal efficiencies and provides a range of stormwater treatment options for developers and roadway designers
Contact: Ed Molash, Water Quality Program, (360) 705-7507

Title: Highway Stormwater BMP Retrofit Program (DOT-112)
Relevant Factors for Decline: All six factors.

Description: WSDOT has designated a project category to fund stand-alone stormwater BMPs where highway projects retrofit stormwater BMP on road sections where stormwater systems will not be upgraded during WSDOT highway improvement projects. Retrofit projects are in the design or project scoping phase in preparation for eventual funding for the project category by the state legislature.
Contact: Ed Molash, Water Quality Program, (360) 705-7507

Title: Capitol Budget Coordination (DOT-113)
Relevant Factors for Decline: All six factors.
Description: Section 715 of the State Capital Budget (SB 6063) directs agencies to coordinate their land acquisition and environmental mitigation actives. WSDOT is facilitating a work group comprised of the departments of Ecology, Parks and Recreation, Fish and Wildlife, Natural Resources, and Community Trade and Economic Development as well as the Interagency Committee for Outdoor Recreation, State Conservation Commission and the Office of Financial Management. A report is due to the Legislature by December 1, 1998. The report will summarize findings on the results of environmental coordination activities and recommendations to further improve the coordination.
Contact: Shari Shaftlein, Initiatives Manager, (360) 705-7446

Phase 2 Actions

Title: Fish Passage Task Force Grant Program (DOT-201)
Relevant Factor for Decline: Barriers to Fish Passage
Description: The Fish Passage Task Force is seeking funding to support expanded barrier inventory and correction. Funds would be dispensed through a competitive grant program or other means using priority criteria. This program would help expand fish barrier corrections by offering funds to parties with identified needs for barrier inventory or correction. This program would be available to cities, counties and others and would award funding on a priority basis. Priorities would factor in quantity and quality of habitat to be gained, cost effectiveness of corrections and benefit for declining salmon stocks. Fish Passage Task Force has representation by state agencies, local governments, tribes, restoration groups, as well as business and environmental groups. This grant program would begin over the next year, with the anticipation that it be continued into the future.
Contact: Paul Wagner (360) 705-7406 and Paul Sekulich (360) 902-2527

Title: Stormwater Outfall Retrofit (DOT-202)
Relevant Factors for Decline: Impaired water quality, sediment transport
Description: Inventory and rank stormwater outfalls discharging into streams above fish barriers. Rank outfalls based on pollutant loading and stream characteristics and habitat requirements. Install appropriate storm water treatment best management practices in conjunction with removal of fish barriers. Coordinate and leverage work for actions of local watershed groups.

Contact: Bert Bowen, Water Quality Program (360) 705-7449.

Title: Flood Management Plan (DOT-203)
Relevant Factors for Decline:
Description: WSDOT is developing a flood management strategy to help identify and prioritize flood reduction projects. This project will include the development of GIS layers and models to improve access to and understanding of flood management issues relating to transportation projects.
Contact: Leni Oman, Watershed Specialist, 360-705-7477

Title: Biomaterials Exchange (DOT-204)
Relevant Factors for Decline: Impaired Water Quality, Riparian Areas and Wetland Degradation
Description: WSDOT is developing a program to make biomaterials removed form construction sites available to organizations involved in habitat restoration.
Contact: Patty Lynch, (360) 705-7448 or Leni Oman (#60) 705-7477

II. FEDERAL GOVERNMENT CONSERVATION ACTIONS

Except for the action descriptions provided by the Forest Service and the Environmental Protection Agency, the descriptions of federal actions were provided by state agency personnel. This material is incomplete at this point. As federal agencies participate in the further development of the LCSCI plan, these descriptions may be revised and additional actions being taken or proposed by federal agencies will be included.

Additional and more specific information from the Forest Service on some of their actions and the priority streams and steelhead stocks to which they are directed is provided under "Priority Habitat Conservation Actions" in Chapter 15. However, the adequacy of individual actions and the overall adequacy of the entire package of state, federal, and local actions in addressing the habitat factors for decline and protecting and restoring steelhead habitat cannot be fully evaluated until watershed assessments and management plans for each of the priority watersheds in the LCSCI area are completed.

Agency: U.S. Army Corps of Engineers

Phase 1 and 2 Actions

Title: Clatskanie/Westport Estuarine Habitat Restoration
Relevant Factor(s) for Decline: Decreased Channel Complexity, Riparian and Wetlands Degradation
Description: The Columbia River Channel Deepening Study (Reach 5) has identified dredging and dredge spoil disposal sites in the Columbia River estuary. Possible mitigation could include reconnecting the upper end of Westport Slough (via culvert, bridge, or dike removal) with the lower Clatskanie River, Oregon, thereby restoring estuarine habitat which is now of little value because it is disconnected at the upstream end. This measure would have to be implemented by the Corps of Engineers.
Contact: Geoff Dorsey - Corps of Engineers, Portland - 503-808-4769
(Curt Leigh - WDFW - 360-902-2422)

Title: Lower Columbia River Habitat Restoration Initiative
Relevant Factors for Decline: Wetlands Loss/Degradation
Description: The Army Corps of Engineers is undertaking a planning project to identify possible areas on the lower river suitable for habitat restoration projects. The planning process would lead to a feasibility study and then a request for project implementation authority. The process is in its early phases and there is funding for this initial effort. The location, scope and restoration actions to be undertaken and additional funding needs will be developed as the process proceeds.

Partners: USACE, EPA, the Ports, Wash Fish and Wildlife, Oregon Fish and Wildlife, CREP
Contact: Pat Obradovich USACE Portland (503) 808-4730

Agency: U.S. Environmental Protection Agency

Phase 1 Action

Title: Temperature Assessment of Mainstem Lower Columbia River
Relevant Factor for Decline: Impaired Water Quality
Description: USEPA in coordination with Washington Department of Ecology, and Oregon Department of Environmental Quality is studying temperature patterns in the lower river to determine the influence of the dams on maximum temperatures and to evaluate options for reducing temperatures at critical times and locations. The scope of the study and most of the details are yet to be finalized. A conference on temperature issues was held on November 6 and 7 in Portland to further define the problem and the study needs. A schedule for implementation and authorization to undertake the work has been obtained.
Partners: EPA, Ecology, DEQ, Northwest Power Planning Council
Contact: Mary Lou Soscia EPA Region 10 (503) 326-5873

Title: Meeting Standards for Total Dissolved Gas in the Lower Columbia River
Relevant Factor for Decline: Impaired Water Quality
Description: USEPA in coordination with the Washington Department of Ecology, Oregon Department of Environmental Quality, the states' fishery agencies and the National Marine Fisheries Service is working with the Corps of Engineers to ensure that the Corps develops and implements a gas abatement plan that would hold total dissolved gas levels within the water quality standard of 110% during periods of spill at mainstem dams.
Contact: Mary Lou Soscia EPA Region 10 (503) 326-5873

Agency: U.S. Forest Service

Phase 1 Actions

Title: Watershed and Habitat Resource Protection and Restoration
Relevant Factor(s) for Decline: All six factors
Description: Continue implementation of the Northwest Forest Plan (4/94) and its associated standards and guidelines for management of National Forest System lands. Implement the plan's Aquatic Conservation Strategy (ACS) which was developed as an integral component to restore and maintain the ecological health of watersheds and aquatic ecosystems. The strategy was designed to protect salmon and steelhead habitat on federal lands managed by the Forest Service and Bureau of Land Management within the full range of Pacific Ocean anadromy. Four key ACS components are: (1) Riparian Reserves, (2) Key Watersheds, (3)

Watershed Analysis, and (4) Watershed Restoration.
Riparian Reserves: Lands along streams, waterbodies, and wetlands where special protective standards and guidelines apply. Geologically unstable and potentially unstable areas are included.
Key Watersheds: A systematic network of large refugia comprising watersheds identified as critical for the maintenance and recovery of at-risk fish stocks and for production of high quality water.
Watershed Analysis: An analytical procedure used by a team of resource specialists to evaluate geomorphic, ecological, and social processes and relationships at the watershed scale. Watershed analysis provides the foundation for restoration and monitoring.
Watershed Restoration: Implementation of a comprehensive, long-term program to restore disrupted watershed processes and rebuild aquatic ecosystem health and integrity.
Contact: Dan Shively, Gifford Pinchot NF (360-891-5108)

Title: Watershed Restoration and Flood Damage Repair
Relevant Factor(s) for Decline: All six factors
Description: The Gifford Pinchot National Forest implements an annual watershed restoration through its Jobs In The Woods program. The annual program averages $750,000 including projects such as riparian planting and thinning, road decommissioning, and fish habitat rehabilitation. In addition, the Forest is implementing a very large flood damage repair program as a result of severe flooding that occurred in 1995, 1996, and 1997. Approximately $45 million have been allocated to the Forest to repair flood damages incurred in these years. Many of the projects include road upgrades to stabilize existing roads and restore fish passage where needed; road decommissioning where roads are deemed no longer necessary; erosion control and stabilization of landslides; and stream channel improvements to restore degraded fish habitat.
Contact: Dan Shively, Gifford Pinchot NF (360-891-5108)

Title: Monitoring of Forest Management Activities
Relevant Factor(s) for Decline: : Decreased Channel and Floodplain Complexity; Riparian Areas and Wetlands Degradation; Impaired Water Quality; Sediment Transport and Fine Sediments; Basin Hydrology and Stream Flow
Description: Continue annual monitoring program of forest management activities to assess protection of riparian and aquatic resources. Both implementation and effectiveness monitoring are conducted on a variety of land management practices occurring across the Forest. Monitoring provides the means for evaluating whether or not specific management standards and guidelines are met during project-level planning and implementation. Results are published annually in the Gifford Pinchot National Forest's Annual Monitoring Report.
Contact: John Roland, Gifford Pinchot NF (360-891-5100)

Title: Fish Habitat Evaluations and Special Studies
Relevant Factor(s) for Decline: Fish Access and Barriers to Passage; Decreased Channel and Floodplain Complexity; Riparian Areas and Wetlands Degradation; Impaired Water Quality; Sediment Transport and Fine Sediments
Description: Inventories of stream channel and riparian area conditions are conducted annually on various streams across the Forest. The Forest is funded each year to conduct surveys on approximately 50 stream miles. From these inventories, the condition of fish habitat and riparian areas are determined. These data are useful in determining needs and priorities for restoration and can provide the basis for long term monitoring of aquatic ecosystem health.
Additionally, the Forest participates with several other partners (WDFW, U.S. Fish & Wildlife Service, National Biological Survey, Trout Unlimited, Clark/Skamania Flyfishers, and others) conducting special studies to evaluate steelhead populations primarily in the Wind and East Fork Lewis rivers. Each year, the Forest receives challenge cost share appropriations to match other partner contributions for special studies or projects. The following types of special studies have been funded and are currently on going: adult steelhead population indices, redd surveys, smolt production estimates, genetic studies, and more.
Contact: Dan Shively, Gifford Pinchot NF (360-891-5108)

Phase 2 Actions

Title: Forest-wide Assessment of Road-related Fish Passage Barriers
Relevant Factor(s) for Decline: Fish Access and Barriers to Passage
Description: Conduct a Forest-wide inventory of road-related fish passage barriers. Determine corrective treatments; systematically prioritize sites for repair; and implement repairs as funds become available through flood damage repair allocations, Jobs In The Woods restoration funds, Knutson-Vandenberg collections, fish habitat improvement appropriations, partnership opportunities, or other.
Contact: Dan Shively, Gifford Pinchot NF (360-891-5108)

Title: Additional Watershed and Fish Habitat Restoration
Relevant Factor(s) for Decline: All Six Factors
Description: Clearly not all of the watershed and fish habitat restoration needs will be met through existing flood damage repair appropriations or other existing funding sources. Should additional funding become available, then other restoration needs on National Forest System lands would be met. Priority would be placed on restoring altered watershed processes and aquatic ecosystem health in key watersheds where at-risk stocks of salmon and steelhead are present.
Contact: Dan Shively, Gifford Pinchot NF (360-891-5108)

Agency: U.S. Geological Survey

Phase 1 Action

Title: Lower Columbia River Long Term Monitoring Plan
Relevant Factor for Decline: Impaired Water Quality
Description: The USGS is coordinating an effort for the Lower Columbia River Estuary Program to address problem areas and concerns identified in the Bi-State Water Quality Study of the lower river. The monitoring plan is due to be completed in the spring of 1998. The plan will address sediment contamination and sources, fish tissue, water column water quality, and habitat. Elements of the plan will be implemented by the various agencies participating in the development process. The target implementation date would be summer or fall of 1998.
Partners: USGS, USEPA, USACE, NMFS, USFWS, Washington Departments of Ecology and Health and WDFW, Oregon Departments of Environmental Quality and Fish and Wildlife, University of Washington, Oregon State University, Oregon Graduate Institute, Columbia river Intertribal Fish Commission, Oregon Trout, Port of Portland, LCREP
Contact: Greg Fuhrer USGS (503) 251-3231

III. LOCAL GOVERNMENT CONSERVATION ACTIONS

Many actions to protect and restore steelhead habitat are being taken by local governments and other organizations within the LCSCI area. Actions by county governments, conservation districts and others are listed below by responsible organization in alphabetical order. Phase 1 actions that will be accomplished with existing resources are listed first; followed by Phase 2 actions that require additional resources and will be undertaken if the needed resources for those actions are made available.

This information represents a baseline of current and proposed actions by local government organizations to protect and restore steelhead and other salmonid habitat. Additional and more specific information on some of these actions and the priority streams and steelhead stocks to which they are directed is provided under "Priority Conservation Actions" in Chapter 15. However, the adequacy of individual actions and the overall adequacy of the entire package of state, federal, and local actions in addressing the habitat factors for decline and protecting and restoring steelhead habitat cannot be fully evaluated until watershed assessments and management plans for each of the priority watersheds in the LCSCI area are completed.

Organization: Clark County Commission

Phase 1 Actions

Title: Habitat Conservation Ordinance (CCC-101)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation
Description: This is a mandated Growth Management requirement and the purpose of this ordinance is to protect valuable fish and wildlife habitat areas for present and future generations and to conserve the functional integrity of the habitats needed to support fish and wildlife populations. The areas impacted by this ordinance are waters as defined by DNR as follows: Type 1 and 2 - 250 ft, Type 3 - 200 feet and Type 4 and 5 - 150 feet. The designation also included Priority Habitat Areas as defined by DFW. Proposed activity within these areas must be reviewed with approval showing that the proposed project substantially maintains the level of habitat functions and values. A key aspect of this ordinance is the ability to work with Clark County to develop a stewardship plan for an individual's property regardless of whether the property owner proposes any development activity. Although this is a Phase I action, its potential to improve habitat should be noted. The Clark County Board of Commissioners only recently adopted this ordinance. It has been in effect for three months. The commissioners, recognizing the importance of this action, have recently allocated funds for the hiring of a biologist to fully implement this ordinance and work with local property owners. Two additional key components of the ordinance are:

- Baseline Survey: There is a commitment in the ordinance to increase inventory information through a baseline survey of local habitats and species. The BOC allocated monies for the 1998 budget for this endeavor and the work is to

begin in the spring of 1998.

- Education component. There is a strong educational component to the Habitat Ordinance which includes a mailing to every property owner potentially effected by this ordinance. That was recently sent out. There is also a commitment to developing manuals for explaining BMP for typical rural and urban land owner activities, providing seminars and presentations for interested owners and groups.

Contact: Peggy Bartels (360) 699-2375

Title: Wetlands Protection Ordinance (CCC-102)
Relevant Factor for Decline: Impaired Water Quality, Decreased Channel and floodplain complexity Riparian Areas and wetland degradation, and Basin hydrology and stream flow.
Description: In 1992, Clark County recognized that wetlands constituted an important natural resource which provides significant environmental functions including the control of flood waters, maintenance of summer stream flows, filtration of pollutants, recharge of groundwater and provision of significant habitat areas for fish and wildlife. The purpose of this ordinance is to provide a balanced wetland protection measure which furthers the goal of no net loss of wetland acreage and function and to encourage the restoration and enhancement of degraded and low quality wetlands.
Contact: Angie Froom (360)699-2375

Title: Stormwater Control Ordinance (CCC-103)
Relevant Factor for Decline: Impaired Water Quality, Decreased channel and floodplain complexity and Basin Hydrology and stream flow.
Description: The purpose of this ordinance adopted in 1994 is to prevent surface and groundwater quality degradation and prevent erosion and sedimentation of creek, stream, wetlands and other waterbodies. To prevent damage to property from increased runoff rates; to protect the quality of waters for drinking water supply, contact recreation, fishing and other beneficial uses. And to further the goals of not net negative impact cause by quantity of runoff entering streams and no net negative change to the quality of runoff entering streams through the implementation of best management practices.
Contact: Ed McMillan (360) 699-2375

Title: Erosion Control Ordinance (CCC-104)
Relevant Factor for Decline: : Impaired Water Quality, Fish access and barriers to passage, Decreased Channel and floodplain complexity and Sediment Transport and fine sediment
Description: The focus of this ordinance is to address the erosion and sedimentation that results from land disturbing activities which increase the risk of flooding and dams fisheries when situation clogs spawning gravel and excessive turbidity impairs aquatic animals. The purpose of the regulation is to minimize erosion from land development and land disturbing activities.

Contact: Maureen Knudson (360)699-2375

Title: Excavation and Grading (CCC-105)
Relevant Factor for Decline: Impaired Water Quality and Sediment Transport and fine sediment
Description: This is a regulation currently in place and part of the Uniform Building Code and sets forth the regulations to control excavation, grading and earth movement construction including fills and embankments, establishes the administrative procedure for issuance of permits; and provides for approval of plans and inspection of grading construction.
Contact: Maureen Knudsen (360)699-2375

Title: Geological Hazardous Ordinance (CCC-106)
Relevant Factor for Decline: Sediment transport and fine sediments and Riparian areas and wetland degradation
Description: The purpose of this regulation, which became effective on August 1, 1997, places limitations on development in geologically hazardous areas consistent with the requirements of the Growth Management legislation. The regulated geological hazards include steep slope hazard areas, landslide hazard areas and seismic hazard areas. This regulation requires a predetermination prior to submittal of any development applications.
Contact: John Manley (360)699-2375

Title: Critical Aquifer Recharge Ordinance (CCC-107)
Relevant Factor for Decline: Impaired water quality
Description: The purpose of the regulation, which became effective on August 1, 1997 is to prevent degradation, and where possible enhance the quality of groundwater. This will be accomplished by limiting potential contaminants within designated Critical Aquifer Recharge areas.
Contact: Mike Merrill (360)699-2375

Title: State Environmental Protection Ordinance (CCC-108)
Relevant Factor for Decline: All factors
Description: This chapter of the Clark County Code references and adopts by reference the appropriate sections of the SEPA rules and includes the rules and policies for exercising SEPA's substantive authority, which means to condition or deny proposals based on SEPA.
Contact: Gary Fish (360)699-2375

Title: Floodplain Combining District (CCC-109)
Relevant Factor for Decline: Decreased channel and floodplain complexity
Description: The purpose of this regulation is to promote the public health, safety and general welfare and to minimize private and public losses due to flood conditions in specific areas. Methods for reducing losses include: controlling the alteration of natural floodplains, stream channels and natural protective barriers

which help accommodate or channel floodwaters, controlling filling, grading, dredging and other development which may increase flood damage and preventing or regulating the construction of flood barriers which will unnaturally diver floodwaters or which may increase flood hazards in other areas.
The county's current floodplain ordinance emphasizes the impacts to public health and safety. It is anticipate that this ordinance will be revised to reflect the variety of issues associated with floodplain management, with an emphasis on consistency with the proposed changes to the Shoreline Master Program and streamlining the permit process for restoration projects. This will be a countywide ordinance and potentially effect all properties under county jurisdiction. It is anticipated that completion and adoption of a revised ordinance will occur by early fall.
Contact: Ed McMillan (360)699-2375

Title: Environmental Combining District (CCC-110)
Relevant Factor for Decline: Riparian areas and wetland degradation
Description: This district covers a specific area of the county known as the Vancouver Lowlands. The purpose of this district is to preserve, protect and enhance wetlands and identified sensitive wildlife habitat, including areas where industrial development is permitted, minimizing the environmental impacts of development in these areas, and ensuring not net loss of wetland areas or functions,
Contact: John Manley (360)699-2375

Title: Comprehensive Plan Policies (CCC-111)
Relevant Factor for Decline: All Factors
Description: Within the recently adopted Comprehensive Plan there are policies/goals addresses these issues. However, the scope of the Plan is more encompassing to the county as a whole. Some key goals/policies in the Plan as they relate to this issue include the following:

- **Goal 2.4** Protect and conserve environmentally critical areas with key policies to follow addressing habitat areas, protection of surface and groundwater, and floodplain protect.
- **Mining Policy 4.5.8** prohibits mining activities within the 100yr floodplain. This is a key policy for the East Fork Lewis River where mining historically has occurred.
- **Goal 6.4** This goal sets the stage for the watershed basin planning effort that have been emphasized by the county in recent years.
- **Goal 8.3** This is in the Parks and Open Space Element of the Plan and emphasizes an open space system which conserves fish and wildlife habitat. One of the key components is the implement of the Open Space Action Plan which includes the public acquisition of lands along riparian corridors.

Contact: Jerri Bohard (360)699-2375

Title: Agricultural/Wildlife Zoning (CCC-112)
Relevant Factor for Decline: Riparian areas and wetland degradation

Description: This is one of the zoning classifications that was retained during the 1994 adoption of the Clark County Comprehensive Plan. This is a 160 acre minimum for a single homesite. The purpose of this designation is to encourage the preservation of agriculture and wildlife use on land which is suited for agricultural production, and to protect agricultural area that are highly valuable seasonal wildlife habitat from incompatible uses. Currently, this zoning designation is in place in an area known as the Vancouver Lowlands which is adjacent to the Columbia River.
Contact: Jeroen Kok (360)699-2375

Title: Rural and Resource Zoning (CCC-113)
Relevant Factor for Decline: Impaired Water Quality, Riparian area and wetland degradation
Description: A variety of rural and resource zoning classifications were adopted as part of the 1994 Clark County Comprehensive Plan. Due to the Growth Management legislation, the county revised its resource designation both in terms of location of resource lands and its terms of minimum lot sizes. The minimum lot size reflects the amount of land (acreage) that is needed in order to place a single family home on that parcel. The county is approximately 420,000 acres; of this approximately 20,000 is water which includes the mayor streams in the county as well as those portions of the Columbia River and the lakes in the northern part of the county within the county boundaries. The remaining acreage currently is divided up approximately as follows: 75,000 acres in the urban growth areas, 128,00 acres in Forest Tier I which has a minimum lot size of 80 acres; an additional 30,000 acres which is Forest Tier II which has a minimum lot size of 40 acres; an additional 72,000 acres which is either Agriculture or Agri-Forest with a minimum lot size of 20 acres, an approximate 2,5 00 acres which is Ag-Wildlife, 10,000 acres in an Urban Reserve category with a 10 acre minimum, 10, 000 acres in public lands with the remainder as rural with a minimum lot size of 5 acres. It should also be noted that an division of land within the rural area requires the property owner to go through a planning process which allows for the evaluation of critical areas such as wetlands, geohazard, shoreline and habitat area review.
Contact: Jerri Bohard (360)699-2375

Title: Columbia Gorge National Scenic Area regulations (CCC-114)
Relevant Factor for Decline: All Factors
Description: A small portion of the Columbia River Gorge National Scenic Area is within the boundaries of Clark County. In April 1996, the county passed regulations which were approved by the Gorge Commission and found to be consistent with and implement the Management Plan for the CRGSNA.
Contact: Jerri Bohard (360) 699-2375

Title: Sewage System Requirements (CCC-115)
Relevant Factor for Decline: Impaired Water Quality

Description: With the passage of the 1994 Comprehensive Plan, a number of development regulations were also passed to implement policies within the Plan. One of these was the requirement that all uses within the urban growth boundaries were to on a sewer system and not on a septic system.
Contact: Robert Higbie (360)699-2375

Title: Transportation - Road Standards (CCC-116)
Relevant Factor for Decline: Fish Access and Barrier to Passage
Description: The main emphasis of the road standards is for the construction and design of a variety of types of roads depending on the volume anticipated and location of the road either public or private roads. The road standards also includes a requirement for consistency with erosion and stormwater regulations. There is also a recognition that certain culverts need to be designed to address fish access/
Contact: Peter Capell (36)737-6118

Title: Code Enforcement (CCC-117)
Relevant Factor for Decline: All Factors
Description: Under Title 32 of the Clark County Code there is an ability to utilize the procedures within this chapter in order to enforce any land use or public health ordinances. Within the chapter is the following:
"All violations of land use and public health ordinances are determined to be detrimental to the public health, safety and welfare and are hereby declared to be public nuisances. All conditions which are determined by a director to be in violation of any land use or public heath ordinance shall be subject to the provisions of this title and shall be corrected by any reasonable and lawful means as provided herein."
Examples of ordinances that this chapter covers includes the following:

- grading without a permit
- surface mining
- Habitat Conservation Ordinance
- Wetlands Protection Ordinance
- Shoreline
- Erosion control
- Stormwater ordinance
- any other conditions required as part of the permitting process.

There is a high level of commitment from the BOC for this endeavor. In fact, during adoption of the 1998 budget there were monies allocated for an additional code enforcement officer.
Contact: Linda Moorehead (360) 699-2375

Title: Density Transfer (CCC-118)
Relevant Factor for Decline: All Factors
Description: Both in the urban growth areas and the rural areas there is a provision for density transfer. Within the urban growth areas the minimum density s based on the net developable land for land dedicated to such uses as sensitive due

to slopes, unstable land, wetlands, etc. However, the developer continues to have the option of transferring all density based on the gross area of the site out of unbuildable areas to those that are buildable. In the Habitat Conservation Ordinance there is a provision which allows for substandard lot sizes provided that the overall density allowances are not exceeded and the proposed lot size and configuration conserve the habitat areas through establishment of a conservation covenant which permanently protects habitat areas.
Contact: Michael Butts (360) 699-2375

Title: Landscaping (CCC-119)
Relevant Factor for Decline: All Factors
Description: Within the county's Site Plan Review/Landscaping provisions (18.402A CCC). There is a provision that landscape materials should be selected and sited to produce a hardy and drought resistant landscape area. Selection should include consideration of soil type and depth, the amount of maintenance required, spacing, exposure to sun and wind, the slope and contours of the site, compatibility with existing native vegetation preserved on the site water conservation where needed.
Contact: Michael Butts (360) 699-2375

Title: Consistency within Local Jurisdictions (CCC-120)
Relevant Factor for Decline: All Factors
Description: There has been a beginning point on this and that is the land use plan between the county and cities is consistency between jurisdictions. Some of the ordinances are difference but others are the same such as the Wetlands Protection Ordinance.
Contact: Jerri Bohard (360) 699-2375

Phase 1 and 2 Actions

Title: Open Space Taxation (CCC-201)
Relevant Factor for Decline: Riparian areas and wetland degradation and Impaired Water Quality
Description: This is an incentive program for property owners to preserve, conserve or maintain or otherwise continue in existence adequate open space lands. Applications can include protection of streams designated shorelines of the state or in the county's shoreline master program. This ordinance is currently undergoing revisions to allow more flexibility to those property owners effected by the recent passage of the Habitat Conservation and Geologically Hazardous Area ordinances. The revisions will allow for additional incentive for property owners to place they property into this program, with a particular emphasis on those individuals participating in developing a Stewardship Plan as allowed under the Habitat Conservation Ordinance. This will be a countywide ordinance and potentially effect all properties under county jurisdiction. It is anticipated that completion and adoption of a revised ordinance will occur by the end of April.

This is a key incentive program, especially for those property owners outside of the urban growth areas; such as along the East Fork and Washougal Rivers. The proposed enhanced program should assist property owners in their endeavor to reduce development and their associated impacts.
A second phase of this work is anticipated to begin in late 1998 or early 1999 and will assess the feasibility of developing a public benefit rating system which could be based on such things as the overall function of the habitat, enhancements to the habitat as proposed under the county' Stewardship Plan as well as the public access issue.
Contact: Jeroen Kok (360)699-2375

Title: Shoreline Combining District (Shoreline Master Program) (CCC-202)
Relevant Factor for Decline: Impaired Water Quality, Decreased channel and floodplain complexity, Riparian areas and wetland degradation and Basin Hydrology and stream flow.
Description: This regulation implements the Clark County Shoreline Master Program to enact the Shoreline Management Act of 1971. There are a number of policy guidelines and criteria which outline what and how development should occur with shorelines of the state. It should be noted that is many circumstances the Habitat Conservation ordinance provides more guidance and structure than our program which is currently over 20 years old. The County is anticipating updating its Shoreline Master Program beginning in late 1998/early 1999 but is awaiting direction from the Washington State Department of Ecology prior to commencing work. It is anticipated that a project of this scope would take approximately two years.
In 1998, Shoreline Master Program revisions will be limited to addressing streamlining the county permit process to facilitate habitat restoration projects. This change would affect all shorelines within Clark County. It is anticipated that due to public comment period and submittal requirements necessary to obtain approval by the Department of Ecology, that the project will take approximately six months from start to finish. It is anticipated that this project will begin in February and anticipate DOE approval by late summer/early fall.
This work is extremely important due to the number of anticipated habitat restoration projects anticipated in the coming years. Also, key portions of both the East Fork Lewis River and Washougal River have been identified as waters of Statewide Significant and providing for restoration projects in these areas is currently the main emphasis of proposed projects.
Contact: Gary Fish (36)699-2375

Title: Transportation - 6 Year Road Improvement Program (CCC-203)
Relevant Factor for Decline: Fish Access and Barriers to Passage
Description: In early 1997, county staff developed an inventory of fish passage problems which were caused by public roads. Staff than prioritized the problem culverts according to expected benefit to the fisheries of correcting the problem and the estimated project cost. Prior to this work, moneys had been allocated at a

rate of $50,000 per year. However, with this inventory it became evident that the funding level needed to be increased. The Commissioners recently adopted the 1998 program which doubles the funding level for this issue for the next three years. Under the recently adopted Six Year Transportation Work Program, the county anticipates spending $100,000 of county monies during 1998, 1999, and 2000; and anticipates spending $50,000 of county monies during 2001, 2002 and 2003. Projects have been identified and prioritized based on early work completed by Public Works. The projects anticipated to be completed are premised on receiving a 50 percent match of monies from the state.
Contact: Pete Capell (36)737-6118

Title: Watershed Basin Planning (CCC-204)
Relevant Factor for Decline: Impaired Water Quality, Decreased Channel and Floodplain complexity and Basin Hydrology and Stream Flow.
Description: The County is in the process of developing basin plans for all its major basins within the county. The timeframe for this work is a policy within the Comprehensive Plan. About a year ago, the county completed and adopted a basin plan for the Burnt Bridge Creek basin and is in the process of finalizing the basin plan for the Salmon Creek -Lakeshore Watershed Basin. The overall goal of the program is to prevent localized flooding, minimize streambank erosion and protect water resources. The plan strives to carry out the overall program goal by doing the following: develop capital improvement projects to control Stormwater runoff volume and remove pollutants from runoff; (b) create a program to reduce sources of pollution to the watershed areas; (c}enhance existing public education and outreach functions to show individuals better ways to protect water resources in these watersheds; and (d) secure a sufficient revenue source to fully implement this plan. The county is in the process of applying for the WRIA grants to continue development of these plans.
Contact: Earl Rowell (360)699-2375

Title: Coordinated Water System Plan (CCC-205)
Relevant Factor for Decline: Basin Hydrology and Stream Flow and Impaired Water Quality.
Description: The Clark County Coordinated Water System Plan is in the process of its 1997 update. This document has been prepared to fulfill regulatory requirements of WAC 248-56 and Chapter 36.94 RCW. The main components of this System Plan include the following: designation of water utility service areas; development of water utility design standards; satellite system management; water supply reservations and water resource assessment. Clark County relies almost entirely upon ground water for public and private use and through this plan there have been significant efforts to provide for the management and protection of the county's groundwater and surface water resources.
Contact: Earl Rowell (360)699-2375

Title: Drywell Monitoring Program (CCC-206)

Relevant Factor for Decline: Impaired Water Quality
Description: The County is in the process of finalizing a program which will reduce water quality degradation from shallow injection wells known as drywells. The project will emphasize practical applications of existing technology management methods to reduce the risk of contamination from existing drywells. Results from the project will help to determine management practices for existing drywells and influence how future stormwater infiltration facilities will be sited, constructed and managed. The project will coordinate drywell related activities with county stormwater planning, stormwater system maintenance, wellhead protection programs and local waste reduction programs.
Contact: Rod Swanson (360)699-2375

Title: National Pollution Discharge Elimination System (NPDES) Storm Sewer Permit (CCC-207)
Relevant Factor for Decline: Impaired Water Quality
Description: Clark County is required by state and federal law to obtain a waste discharge permit for all storm sewers that empty to surface water or groundwater. The county is to complete the permit application by the end of 1997 and the permit will be issued in 1998 and every five years thereafter. Industrial stormwater discharges for county storm sewers and construction activities over five acres must obtain a separate NPDES permit.
NPDES permitting requires two basin approaches to control pollutant discharges. One is source control, which keeps pollutants from entering stormwater to begin with. The other is treatment, which attempts to remove the pollutants already in the stormwater. To accomplish this, the core requirement of the NPDES permit is a s stormwater management program. The stormwater management program describes the county's activities to reduce stormwater pollution and degradation of Clark County's water resources. The NPDES program is therefore administrative activity that describes and monitors county programs which are described in the NPDES stormwater management program and intended to meet NPDES permit requirements.
Contact: Ed McMillian (360)699-2375

Title: East Fork Lewis River Project (CCC-208)
Relevant Factor for Decline: Impaired Water Quality
Description: The purpose of the East Fork Lewis River Watershed Action Plan is to develop a comprehensive workable solutions to the watershed's nonpoint source pollution problems. The plan addresses several major categories of nonpoint sources: agriculture, development, forestry, nonindustrial hazardous wastes, on-site sewage treatment, recreation, surface mining, and stormwater runoff. Control strategies for these categories of sources are grouped in a series of tables representing a hierarchy of recommendations. Most strategies are specific to a category of nonpoint source pollution except for overall educational strategies. Recommendations are further structured to allow for flexible levels of implementation over time and areas. The plan was just completed in the last year

and the implementation process is just beginning. The first part of which is outreach and education regarding the issues for the East Fork Lewis River.
Contact: Bob Hutton (360)699-2375

Title: Overall County Monitoring Locations (CCC-209)
Relevant Factor for Decline: Impaired Water Quality
Description: There are a variety of ongoing monitoring programs and activities throughout Clark County. These are done primarily by either Clark County or Clark Public Utilities. Some are already in place and others are being planned for. There are three Burnt Bridge Creek locations which are monitored monthly for basic water quality concerns. An automated water quality monitoring station is being established for the Lacamas Creek basin. In the East Fork a state grant in the early 1990's funded monitoring at nine stations and it is anticipated that an automatic sampler will be installed at a site on the lower East Fork Lewis River. Clark Public Utilities routinely samples nine stream points in Salmon Creek basin and share the data with the county.
There are also three stream gages to monitor flow at Lacamas Creek; three gages for Burnt Bridge Creek; four gages for Salmon Creek and currently one gage for the East Fork Lewis River.
Contact: Rod Swanson (360)699-2375

Title: Public Lands Ownership/Conservation Futures Program (CCC-210)
Relevant Factor for Decline: Riparian areas and wetland degradation and fish access and passage.
Description: Currently, the county does collect the 6 ¼ % real estate transaction tax which does towards the acquisition of open space lands. As part of the criteria for determining which lands should be acquired, the county utilizes the Open Space Action Plan. This plan identified the primary acquisition need as riparian corridors, with the main emphasize on the East Fork Lewis River. In order to facilitate acquisition of these lands, the county bonded against the Conservation Futures moneys and has been successful in acquiring hundreds of acres along the River The county has been equally successful in leveraging this acquisitions and moneys against the state's Interagency Committee Committee's grant program. The map illustrates the lands within the county that are in public ownership. This includes the two federal wildlife refuges, the state park lands, lands owned the State Fish and Wildlife Department, the Department of Natural Resources and the local (county and city) greenspaces ownership which illustrates the successful acquisitions along Salmon Creek and East Fork Lewis River in particular.
Contact: Glenn Lamb (360)735-8839

Phase 2 Actions

Title: Develop Rural Handbook (CCC-211)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation
Description: The county recently sent a newsletter to property owners potentially

effected by the new Habitat Conservation Ordinance. This handbook could be a continuation of this effort of notification and education of both property owners and citizens within the county. The need has been identified within the county's adopted comprehensive plan. The initial thought is that the handbook would lay the groundwork for individuals to become good stewards of the land, explain the importance of being a good steward and to provide names and phone numbers of those agencies and organizations that could provide additional information.
It is possible that the handbook could be designed to be part of the local phone book, handed out by the various Chambers of Commerce as well as real estate offices and local jurisdictions building departments.
Contact: Jerri Bohard (360) 699-2375

Title: Complete Revision of County's Shoreline Master Program (CCC-212)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation
Description: This has been identified as a need not only in the county's Comprehensive Plan but also through recently passed legislation which made the Shoreline Master Program an element of the Comprehensive Plan. The county's SMP has not been completely revisited and revised since the mid 1970s. There has been a great deal of change from definitions associated with critical lands as required by GMA to additional scientific knowledge regarding the most appropriate ways to protect and enhance shorelines.
The county anticipates the ability to complete a short term fix to address the ability to permit habitat restoration projects, there is a definite need to totally revisit and revamp the county's entire program. It is anticipated that this is a multiyear program and impacts waters of Statewide significant, without financial assistance it is unclear when the county will be able to complete this work.
Contact: Jerri Bohard (360) 699-2375

Title: Completion of a Basin Plan for the East Fork Lewis River (CCC-213)
Relevant Factor for Decline: Impaired Water Quality
Description: In the past couple of years, the county has completed two basin plans as outlined in the county's comprehensive plan. The first was for the Burnt Bridge Creek basin and the second is being finalized for the Salmon Creek basin. This plans evaluate the existing problems associated with flooding and other stormwater issues and proposes options to address these existing deficiencies. A main function of the plan is to develop the foundation for establishing a stormwater utility fee. A similar plan needs to be completed for the East Fork Lewis River. This is especially true as it has been defined as a priority area with regards to endangered species concerns. Without a basin plan it will be difficult for the county to find the financial resources necessary to correct any problems associated with existing development.
Contact: Jerri Bohard (360) 699-2375

Title: Development of a Monitoring Program (CCC-214)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation

Description: Through the GMA process the county has recently adopted a number of ordinance which address the protection of a variety of critical lands. These ordinances have been in place in some cases for less than a year; it would be beneficial to develop a monitoring program to evaluate the effectiveness of these ordinances and identify any needed revisions to the existing ordinances.
Contact: Jerri Bohard (360) 699-2375

Title: Revise Enforcement Procedures (CCC-215)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation
Description: The existing chapter within the county code needs to be revisited and revised to take into account the variety for critical lands ordinances that have been put into effect due to growth management. This is especially important because the county's focus has emphasized enforcement while trying to minimize the number of regulations.
Contact: Jerri Bohard (360) 699-2375

Title: Volunteer Coordinator Position (CCC-216)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation
Description: Funding for this position would be key if the county is to become an active member in the coordination of habitat restoration projects which would include everything from coordinating volunteers for projects initiated by organizations such as Fish First to working with these organizations to expedite any necessary permits.
Contact: Jerri Bohard (360) 699-2375

Title: Direct Projects (CCC-217)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation
Description: While the county currently does not have a prioritized list of habitat restoration projects, monies to assist those organizations that might would be of benefit but could include at a minimum the monies necessary for any permits. However, the county currently is in the process of siting a new work release project, which is projected to be a plant nursery. Funding to develop a nursery which specializes in those plants used for streambank restoration could be beneficial both for future restoration projects and the work release program.
Contact: Jerri Bohard (360) 699-2375

Organization: Clark Public Utilities, Clark County

Title: Assistance to Landowners (CPU-101)
Purpose: Conserve and enhance water, fish, wildlife and habitat
Description: As part of Clark Public Utilities interest in improving our community, we voluntarily assist private landowners with measures to control erosion (sediment-turbidity) control, reduce water temperature, enhancement fish and wildlife habitat, aquifer recharge and we monitor the water quality and

quantity in select areas. We also provide educational activities and information. Everything we do in voluntary and we have no regulatory authority.

Phase 1 Action: We work with landowners to determine the most natural method to make improvements to meet their needs on their property. We then assist with technical advise and help secure the necessary permits. All at no cost. We also provide, host and activate local learning and educational activities, events and information.

Phase 2 Action: We provide animal exclusionary fencing to the landowner; including off stream watering; provide and plant native vegetation for landowners; and clean up trash. All at no cost to a landowner.

We jointly fund the installation of "fish friendly" culverts--we pay for the culvert. We provide the permits, engineering, root wads, vegetation and construction over-site necessary to fix eroding stream banks--we also offer $10,000 no-interest loans to help landowners pay for the construction.

We host the Salmon Creek Water Festival, which provides training for thousands of school children and adults and the Home and Garden Idea Fair which includes two buildings dedicated to environmental stewardship. We also provide fish aquariums in classrooms as a learning tool.

We fully fund the operations of the Washington State Department of Fish and Wildlife's Vancouver Trout Hatchery and Evergreen Fisheries Park, provide fish egg box instructions and plans and we annually raise 25,000 fish in net pens for release into Salmon Creek. All voluntarily.

Contact: Dean Sutherland, Environmental Resources Manager
PO Box 8900, Vancouver, WA 98668
(360) 992-3386, Fax (360) 992-3204
E-mail: deans@clarkpud.com

Organization: Clark County Conservation District

Phase 1 Actions

Title: Manure, Composting, and Pasture Management Workshop. (CCD-101)
Purpose: Provide landowners with information to protect water quality.
Description: A workshop to educate landowners on best management practices that will positively impact water quality in Clark County was held in 1997. The workshop addressed erosion control, and animal waste management. Attendance count: 100.
Partners: Clark County Conservation District, Natural Resources Conservation Service, Clark County Water Resources Division, WSU Cooperative Extension Service.
Contact: Rich Bachert, (360) 696-7631.

Title: Tree Donation for Riparian Planting. (CCD-102)
Purpose: To plant the riparian area along a stretch of the East Fork Lewis River.

Description: The Clark County Conservation District donated 200 red alder trees for a riparian planting project by Habitat Partners. The planting will protect the streambank from erosion, provide shade to the river, and improve riparian habitat.
Partners: Clark County Conservation District and Habitat Partners.
Contact: Bill Dygert, (360) 696-1388.

Title: Belkoff-Parker restoration. (CCD-103)
Purpose: To reforest former farmland and replant riparian areas along Chelatchie Creek.
Description: A former farm site along Chelatchie Creek will be replanted with a variety of native trees. The south side of the creek is fairly void of vegetation and will be replanted along with additional plantings on the north side of the stream. Revegetation of the wetland on the property and reforestation of an old pasture will also be implemented. This project will begin in 1998. There are two steelhead redds on this reach of the stream according to a 1995-1996 survey.
Partners: Clark County Conservation District, Fish First, Belkoff-Parker - landowners.
Contact: Lisa Bucy, (360) 696-7631.

Title: Kennedy Farm Best Management Practice. (CCD-104)
Purpose: To assist in the utilization of dairy waste in agronomic application.
Description: A buried mainline pipe was installed at the Kennedy dairy farm to transport liquid manure from the waste storage pond to pasture land for agronomic application. By monitoring the nutrient content of the liquid manure, proper application on the pasture provides an environmentally safe use for the animal waste.
Partners: Clark County Conservation District, Gee Creek Restoration Committee, U.S. Fish and Wildlife, Greater Vancouver Rotary Club, City of Ridgefield, Clark County, Southwest Washington Health District, Natural Resources Conservation Service, Kennedy - landowner.
Contact: Gordon Franklin, (360) 696-7631.

Title: Hanson Farm Best Management Practices. (CCD-105)
Purpose: To protect Gee Creek from contamination by animal waste.
Description: Riparian fencing and streambank revegetation was implemented along Gee Creek on the Hanson Farm. The fencing is a best management practice designed to keep cattle from the stream; therefore, reducing fecal coliform contamination and protecting the streambank from trampling. The planting will help stabilize the bank and provide shade for the stream.
Partners: Clark County Conservation District, Gee Creek Restoration Committee, U.S. Fish and Wildlife, Greater Vancouver Rotary Club, City of Ridgefield, Clark County, Southwest Washington Health District, Natural Resources Conservation Service, Hanson - landowner.
Contact: Lisa Bucy, (360) 696-7631.

Title: Tree Planting on Gee Greek with Ridgefield High School. (CCD-106)
Purpose: To revegetate the riparian area along Gee Creek.
Description: The Clark County Conservation District donated 11,600 trees and 2,500 shrubs to be planted along Gee Creek. Students from Ridgefield High School coordinated tree plantings along Gee Creek using area volunteers as planters. The Natural Resources Conservation Service provided technical assistance in tree planting instruction. Riparian plantings stabilize streambanks, improve riparian habitat, and provide shade to the creek.
Partners: Clark County Conservation District, Gee Creek Restoration Committee, U.S. Fish and Wildlife, Greater Vancouver Rotary Club, City of Ridgefield, Clark County, Southwest Washington Health District, Natural Resources Conservation Service, Ridgefield High School.
Contact: Gordon Franklin, (360) 696-7631.

Title: Vrieswyk Dairy Farm Plan and Environmental Quality Incentive Program Assistance. (CCD-107)
Purpose: To assist dairy farmers to improve operations by implementing best management practices.
Description: The Environmental Quality Incentive farm bill program administered through the Natural Resources Conservation Service supplies cost-share funding for dairy operators to completely implement farm plans, thereby, protecting water quality in adjacent streams. The farm plan is currently being written.
Partners: Natural Resources Conservation Service, Clark County Conservation District, Vrieswyk- landowner.
Contact: Lisa Bucy, (360) 696-7631.

Title: Kive Hobby Farm Best Management Practices. (CCD-108)
Purpose: To improve management of farm operations to protect water quality to Lacamas Creek.
Description: Best management practices were implemented according to Natural Resources Conservation Service standards. Animal confinement, French drain, waste storage, and roof gutters were the management practices installed on this hobby farm along Lacamas Creek. These practices will protect the creek from animal waste contamination. This creek is an inlet to Lacamas Lake.
Partners: Clark County Conservation District, Natural Resources Conservation Service, Clark County Water Resources Division, Kive - landowner.
Contact: Rich Bachert, (360) 696-7631.

Title: Daybreak Dike (CCD-109)
Purpose: Flood protection including improved fish habitat on the East Fork Lewis River.
Description: Large woody debris and willow plantings to provide shade and bank stabilization was included in the construction of the Daybreak Dike on the East Fork Lewis River.
Partners: Natural Resources Conservation Service, Clark County Conservation District, Clark County, Washington Department of Fish and Wildlife, and adjoining landowners.
Contact: Doug Fenwick, (360) 696-7631.

Title: Fish (owner) Farm Plan and Best Management Practices. (CCD-110)
Purpose: Protect Lacamas Creek from contamination by hobby farm.
Description: A farm plan was completed and best management practices were installed on the Fish property, adjacent to Lacamas Creek. Surface water management for animal waste control and a drystack for animal waste was designed and constructed. The nearby stream is an inlet to Lacamas Lake.
Partners: Natural Resources Conservation Service, Clark County Conservation District, Clark County Water Resources Division, Fish - landowners.
Contact: Rich Bachert, (360) 696-7631.

Title: Livingston Mountain Dairy Farm Plan. (CCD-111)
Purpose: Assist dairy operator in protecting water quality by incorporating best management practices in farm operations.
Description: A plan was written according to Natural Resources Conservation Service specifications to assist the dairy farmer in using best management practices, thereby, protecting the adjacent stream from animal waste and nutrient contamination. The nearby stream is an inlet to Lacamas Lake.
Partners: Natural Resources Conservation Service, Clark County Conservation District, Clark County Water Resources Division, Baldwin - landowners.
Contact: Rich Bachert, (360) 696-7631.

Title: McAtee Farm Plan (CCD-112)
Purpose: Protect Lacamas Creek from contamination by hobby farm by recommending best management practices for farm operations.
Description: A farm plan was written according to Natural Resources Conservation Service specifications and best management practices were recommended, for a hobby farm adjacent to Lacamas Creek. The nearby stream is an inlet to Lacamas Lake.
Partners: Natural Resources Conservation Service, Clark County Conservation District, Clark County Water Resources Division, McAtee - landowner.
Contact: Rich Bachert, (360) 696-7631.

Title: Price Dairy Farm Plan and Environmental Quality Incentive Program Assistance. (CCD-113)
Purpose: To assist dairy farmers to improve operations by implementing best management practices.
Description: The Environmental Quality Incentive farm bill program administered through the Natural Resources Conservation Service supplies cost-share funding for dairy operators to completely implement farm plans, thereby, protecting water quality in adjacent streams. The farm plan is currently being written and many interested agency, industry, and special interest groups are also assisting in implementing additional improvements to riparian areas and wetlands on this property. The project is in progress and will continue for several years. The Price farm is on Chelatchie Creek, a steelhead spawning stream.
Partners: Natural Resources Conservation Service, Clark County Conservation District, Fish First, U.S. Fish and Wildlife, Washington Department of Fish and Wildlife, Lower Columbia Fish Enhancement Group, Habitat Partners, Price - landowners.
Contact: Lisa Bucy, (360) 696-7631.

Title: Gillette Farm Best Management Practices. (CCD-114)
Purpose: To exclude beef cattle from a stream and wetland, and improve riparian habitat and bank stabilization.
Description: Best management practices are being implemented on the Gillette Farm along an unnamed tributary to Chelatchie Creek. Fencing will be installed to exclude cattle from a wetland and the stream. Excluding cattle from the stream reduces fecal coliform contamination and reduced sediment input from bank erosion. The streambank will be planted with native cedar to provide shade to the stream and erosion protection. This project was initiated in 1997 and will be completed in 1999.
Partners: Clark County Conservation District, Natural Resources Conservation Service, and Gillette - landowner.
Contact: Lisa Bucy, (360) 696-7631.

Title: Spence Hobby Farm Technical Assistance. (CCD-115)
Purpose: To assist landowners in implementing best management practices recommended by the Natural Resources Conservation Service.
Description: Technical assistance was given to the Spence hobby farm on manure management practices to protect Lacamas Creek. This creek is an inlet to Lacamas Lake. This assistance was given in 1997.
Partners: Natural Resources Conservation Service, Clark County Conservation District, Clark County Water Resources Division, Spence - landowner.
Contact: Rich Bachert, (360) 696-7631.

Title: Roth Dairy Best Management Practice. (CCD-116)
Purpose: Surface water management for animal waste control.
Description: Roof water management through rain gutter installation was completed on the Roth Dairy. This best management practice was recommended in a previously written farm plan.
Partners: Natural Resources Conservation Service, Clark County Conservation District, Roth - landowners.
Contact: Rich Bachert, (360) 696-7631.

Title: Anderson Dairy Farm - Waste Storage Pond. (CCD-117)
Purpose: To protect Lacamas Creek from dairy waste contamination.
Description: A dairy waste storage pond was designed and constructed according to Natural Resources Conservation Service standards on the Anderson Dairy Farm, located on Lacamas Creek. Also manure meters were purchased by the dairy to measure the nitrogen, phosphorus, and potassium content of manure ponds. This information is used to determine agronomic application rates of manure.
Partners: Natural Resources Conservation Service, Clark County Conservation District, Clark County Water Resources Division, Anderson - landowner.
Contact: Rich Bachert, (360) 696-7631.

Title: Crusher Road Site. (CCD-118)
Purpose: Reduce erosion of bank sediment to Salmon Creek.
Description: This bank stabilization project on Salmon Creek was implemented in September/ October 1997. Stream barbs were established to redirect the flow and protect the bank, also a rock toe and vegetated geogrids were installed to stabilize the bank and provide shade and riparian habitat. Large woody debris was placed in the stream to help create fish habitat. The project stabilized 500 feet of streambank.
Partners: Natural Resources Conservation Service, Clark County Conservation District, Vancouver/Clark Parks and Recreation.
Contact: Doug Fenwick, (360) 696-7631.

Title: Ballpark Site on Salmon Creek. (CCD-119)
Purpose: Reduce erosion of bank sediment to Salmon Creek.
Description: This bank stabilization project on Salmon Creek was implemented in August/ September 1997. Stream barbs were established to redirect the flow and protect the bank, also a rock toe and vegetated geogrids were installed to stabilize the bank and provide shade and riparian habitat. The top of the bank was hydroseeded to rapidly protect exposed soil. The project stabilized 160 feet of streambank.
Partners: Natural Resources Conservation Service, Clark County Conservation District, and Vancouver/Clark Parks and Recreation.
Contact: Doug Fenwick, (360) 696-7631.

Title: Pleasant Valley Site (CCD-120)

Purpose: Reduce erosion of bank sediment to Salmon Creek.
Description: This bank stabilization site on Salmon Creek was implemented in September/ October 1997 and was also used as a demonstration site for the Natural Resources Conservation Service National Bioengineering Training Course hosted by the Brush Prairie Field office.
Soil backfill was used to save existing cedars along the bank that provided shade to the stream. A rock toe and vegetated geogrid was installed to stabilize the streambank. Willow and cottonwood cuttings were planted, along with the integration of willow brush mattresses and fascine bundles to stabilize the streambank. This plant material will grow to also provide shade and riparian habitat. Four hundred feet of streambank was stabilized.
Partners: Vancouver/Clark Parks and Recreation, Natural Resources Conservation Service, Clark County Conservation District.
Contact: Rich Bachert, (360) 696-7631.

Organization: Cowlitz County Commission

Phase 1 Actions

Title: Critical Areas Ordinance (CCC Chapter 19.15). (COC-101)
Description: This ordinance recognizes that fish and wildlife habitat conservation areas perform important physical and biological functions. Areas important to maintenance of fish habitat are specifically recognized as "critical areas" by this ordinance. Critical area permits are required for regulated activities; the Department of Building and Planning administers this review and permitting process.

CCC 19.15.130 specifically addresses fish and wildlife habitat conservation areas. This section classifies nine different fish and wildlife habitat conservation areas consistent with WAC 365-190-080(5) and establishes development performance standards for regulated development within such areas. A habitat management plan may be required if regulated activity is located within 250 feet of a class 1 habitat area (i.e., "areas with which state designated endangered, threatened or sensitive species have a primary association"). Habitat protection for other areas is accomplished via the ordinance's performance standards, through coordination with the State Department of Fish and Wildlife and the Department of Natural Resources, and through other permit processes such as shorelines management, state hydraulics, and forest practices.
Contact: Jerry Weitz, (360) 577-3052

Title: CCC Chapter 19.11, Environmental Policy (SEPA). (COC-102)
Description: This is the county's ordinance that implements the State Environmental Protection Act (RCW 43.21C.120 and WAC 197-11). SEPA is a review process designed to encourage involvement in decisions that significantly affect environmental quality. WAC 197-11-44 defines elements of the

environment which include "habitat for and numbers or diversity of species of plants, fish or other wildlife, as well as unique species and fish or wildlife migration routes. Generally, if not categorically exempt, development proposals are reviewed for compliance with SEPA and a determination of significance (DS), mitigated determination of non-significance (MDNS), or determination of non-significance (DNS) is issued by the Department of Building and Planning as lead agency. An environmental impact statement (EIS) is required for projects that receive a determination of significance.
Contact: Jerry Weitz, (360) 577-3052

Title: Shorelines Management (Master Program). (COC-103)
Description: The county's shoreline management master program is designed to implement the Shorelines Management Act of 1971 (RCW 90.58) and associated rules for permitting and enforcement (RCW 173-27). A specific purpose of the master program is to enhance shorelines and protect against adverse effects to vegetation, wildlife, water, and aquatic life. The Department reviews and recommends, and the Board approves, shoreline management substantial development permits for certain projects when found to be consistent with the master program (for procedures, see CCC Chapter 19.20). A wide number of provisions in the master program can be cited that directly or indirectly relate to protection of fish habitat. Developments receiving substantial development permits must conform to federal and state requirements, including those of the State Department of Fish and Wildlife.
Contact: Jerry Weitz, (360) 577-3052

Title: Comprehensive Plan. (COC-104)
Description: The comprehensive plan itself is not an ordinance. However, it is used as a guide in making development decisions by the Department, Planning Commission, Board of Commissioners, other agencies, and the public. The natural resources element of the comprehensive plan contains a policy specific to fish and wildlife habitat. It reads: "Documented unique fish and wildlife habitats and unique natural areas should be preserved. All appropriate state and local resource agencies and all other interested persons and agencies should participate in a study to define and identify these natural features." Note that the comprehensive plan is implemented by other county codes, including land use (CCC 18.10) and the various subdivision ordinances.
Contact: Jerry Weitz, (360) 577-3052

Title: Road Drainage and Fish Passage Improvements (COC-105)
Relevant Factor for Decline: Fish Access and Barriers to Passage
Description: The 1998 Cowlitz County Road Program earmarks $600,000 for drainage improvements, an increase of $350,000 over 1997, This money is allocated primarily to culvert replacement. In an attempt to aid in project prioritization, Cowlitz County Public Works Department is currently in discussions

with WDFW to merge lists of culverts having hydraulic problems with those acting as fish passage barriers.
Contact: Kent Cash, Asst. County Engineer (360) 577-3030

Organization: Cowlitz Conservation District and Corresponding Local Landowner Advisory Committees

Phase 1 Actions

Title: Arkansas Creek and Silver Lake Watershed Management Plan Implementation (CWD-101)
Relevant Factor(s) for Decline: Barriers, Channel Complexity, Riparian/Wetland, Sediment Transport, Water Quality, and Basin Hydrology
Description: Cowlitz Conservation District assisted the Arkansas Creek and Silver Lake watershed communities develop watershed management plans. Arkansas Creek and Silver Lake watersheds are subwatersheds within the Cowlitz River watershed and encompass forestry, rural, and urban land use. Plans were developed through a consensus building approach involving decision-makers in the watershed (landowners and land managers) as well as other interests including natural resource agencies, local government, and interest groups. The District has been assisting these watershed communities implement their plans as available resources allow. Examples of implemented practices include; correcting fish barriers, improved road drainage, road erosion control, fencing to manage livestock access to streams, improved pasture management, riparian restoration, streambank stabilization, improved pasture management, septic system maintenance, and providing alternative livestock watering facilities. The expected results include improved management of natural resources and restoration of problem areas that will result in improved water quality and fisheries habitat.
Contact: Darin Houpt, (360)425-1880

Title: Leckler Creek Watershed Management Planning and Implementation Project (CWD-102)
Relevant Factor(s) for Decline: Barriers, Channel Complexity, Riparian/Wetland, Sediment Transport, Water Quality, and Basin Hydrology
Description: Cowlitz Conservation District is currently assisting the Leckler Creek watershed community address their watershed issues and concerns. The project relies on a consensus building approach toward the development and implementation of a watershed plan. A consensus group made up of watershed landowners, land managers, local government, and interest groups provide the decision making body for the project. Natural resource agencies are partnering in the approach to assist the consensus group assess resource conditions and make decisions based on sound science. The watershed communities issues and concerns focus on fisheries and water quality. The District has assisted the community identify their issues and concerns, compiled available information to convey historic and current conditions, and has begun field assessments in the

watershed. Stream surveys have been completed on all the anadromous fish bearing water in the watershed. The survey includes identification of fish passage issues, physical characteristics of the stream, riparian conditions, fish habitat, large woody debris, channel stability conditions, and non point sources from upslope activities. Additional assessment work, as resources allow, will include assessments of roads, forest management activities, agriculture management activities, mass wasting features, surface erosion, and hydrology. Implementation activities have been ongoing as the field work progresses. Examples of best management practices implemented, and in the design process, to date include; 2 riparian restoration projects, 11 culvert replacements, 4,000 feet of riparian fencing, 4,000 feet of riparian restoration, 1 bio-engineering streambank stabilization project, and 2 large woody debris placement projects.
Contact: Darin Houpt, (360)425-1880

Phase 2 Actions

Title: Arkansas Creek Watershed - Monahan Creek Culvert (CWD-201)
Relevant Factor(s) for Decline: Barriers
Description: The Arkansas Creek watershed advisory committee (landowners) recognize the Monahan Creek box culvert as a concern for fish passage in their watershed plan. The culvert presents a barrier limiting fish access to 3.5 miles of habitat. Washington Department of Fish and Wildlife biologists reviewing the project site indicated that the habitat above the structure is perhaps some of the best habitat in the area. Correction of the problem has been estimated at $200,000 by WDFW.
Contact: Darin Houpt, (360)425-1880

Organization: Cowlitz and Wahkiakum Conservation Districts

Phase 1 Actions

Title: Displaced Fisher Stream Habitat Surveys (2-year program in Wahkiakum County and 1-year program in Cowlitz Co.) (CWC-101)
Relevant Factor(s) for Decline: Barriers, Channel Complexity, Riparian/Wetland, Sediment Transport.
Description: Through the Displaced Fisher Program in Cowlitz and Wahkiakum Counties emphasis was placed on collecting stream habitat survey data. The data consisted of collecting information pertaining to fish passage issues, physical characteristics of the channel, channel stability, riparian condition, fish habitat unit stratification, large woody debris, and upslope activities leading to stream degradation. The data was entered and is being managed in a MS Access database. The information was used to identify restoration opportunities for which the Fisher program could provide implementation assistance. Through the program stream data was collected for the Grays River (tier 3), Deep River, Jim Crow Creek, Skamokawa Creek (tier 4), and Elochoman River (tier 5) watersheds

in Wahkiakum County. In Cowlitz County data was collected for the Germany Creek (tier 5) and Abernathy Creek (tier 4) watersheds. Best management practices implemented through this program include; development of 5 farm conservation plans, 82,618 feet of riparian fencing, 1,221,103 feet of fish bearing water surveyed, placement of 29 large woody debris instream structures (4,000 feet of stream), 180 feet of spawning gravel placement, 1 debris jam removal, 4,500 trees planted in riparian zones and for erosion control, conducted spawner surveys on 53 streams (402,599 feet of stream). Funding for the program was not re-authorized and the field portion of the program ended in December 1997.
Contact: Darin Houpt, (360)425-1880 or (360) 795-8240

Title: General Technical Assistance (CWC-102)
Relevant Factor(s) for Decline: Barriers, Channel Complexity, Riparian/Wetland, Sediment Transport, and Impaired Water Quality
Description: Conservation Districts through a memorandum of understanding with the Natural Resources Conservation Service provide technical assistance to landowners on a daily basis. Technical assistance is provided to landowners in the form of site specific practices to solve a resource concern or through the development of whole farm conservation plans. The assistance provided is based upon the NRCS technical guide. All of the planning and practices are based on a whole resource perspective. In Cowlitz and Wahkiakum County a majority of our planning assistance is for forest management and agriculture management. Typical types of practices we assist landowners with include erosion control (surface erosion and mass wasting), streambank stabilization, riparian restoration, dairy waste management, pasture management, fencing, and alternative water sources for livestock.
Contact: Darin Houpt, (360)425-1880 or (360) 795-8240

Phase 2 Actions

Title: Phase II Stream Habitat Survey and Habitat Restoration (CWC-201)
Relevant Factor(s) for Decline: Barriers, Channel Complexity, Riparian/Wetland, Sediment Transport, and Impaired Water Quality
Description: Cowlitz and Wahkiakum Conservation Districts have submitted a proposal to Department of Natural Resources and Department of Fish and Wildlife's Jobs for the Environment program. There are two key elements to our proposal. First, we intend to continue the stream survey work started under the Displaced fisher program and collect stream habitat data for the Mill Creek (tier 5), Ostrander Creek, Coweeman River (tier 3), and Kalama River (tier 1) watersheds. Second we intend to continue implementing best management practices based on the data collected. Emphasis for implementing practices will be placed in watershed that have watershed plans or are in the process of plan development.
Contact: Darin Houpt, (360)425-1880

Title: Watershed Planning and Implementation Projects (CWC-202)

Relevant Factor(s) for Decline: Barriers, Channel Complexity, Riparian/Wetland, Sediment Transport, and Impaired Water Quality
Description: Cowlitz and Wahkiakum Conservation Districts intend to continue what we feel is a highly successful approach to watershed management at the local level. Prior to the steelhead listing, the districts had prioritized watersheds within the two counties based on available information including WDFW SASSI report, DOE-303(d) list, local knowledge, and, often overlooked, public interest. This priority list was used through the displaced fisher program for stream habitat survey data collection. The priority list and availability of habitat survey is currently directing our efforts toward the Abernathy Creek, Mill Creek, and Germany Creek Watersheds. We also recognize the opportunity to build upon the watershed analysis completed by Weyerhaeuser for the Upper Coweeman by working with the local community in the Lower Coweeman WAU.
Contact: Darin Houpt, (360)425-1880

Organization: Lewis County Commissioners, Lewis County Public Services (Community Development and Public Works)

Phase 1 Actions

Title: GMA Critical Areas Ordinance and Comprehensive Land Use Plan (LCC 100)
Factor(s) for Decline: Decreased Channel and Floodplain Complexity, Riparian Areas and Wetland Degradation, Impaired Water Quality, Sediment Transport and Fine Sediments, Basin Hydrology and Stream Flow.
Description: The Lewis County Planning Division adopted their GMA Critical Areas Ordinance in June of 1996. This ordinance was the county's first step in the GMA planning process. The ordinance regulates development activities within or near wetlands, streams, frequently flooded areas and sensitive fish and wildlife habitat. Through the local review process any impacts shall be mitigated for a no net-loss of habitat. The County has also begun the GMA Comprehensive Land-Use planning process and the Cowlitz River watershed could be a sub-area element of this plan. This process is intended to designate development densities and standards for both urban and rural areas. The goal is to improve the natural resource land management within the county and to regulate future development in a responsible manner. These regulations are formulated with guidance from the Department of Community, Trade and Economic Development and the Department of Ecology.
Timeframe: Completed by the end of 1999.
Contact: Mike Zengel, Planning Manager (360) 740-1144.

Title: Amendment to the Shorelines Master Program (LCC 101)
Factor(s) for Decline: Decreased Channel and Floodplain Complexity, Riparian Areas and Wetland Degradation, Impaired Water Quality, Sediment Transport and Fine Sediments, Basin Hydrology and Stream Flow.
Description: The Lewis County Planning Division is currently in the process of amending their Critical Areas Ordinance language for wetlands protection and mitigation into their Shoreline Master Program. This will allow greater flexibility in requiring and implementing the proper mitigation to achieve a no net-loss in wetland protection. This action is being undertaken in coordination with the Washington State Department of Ecology.
Timeframe: Amendment should be completed by the spring of 1998.
Contact: Marc Duboiski, Shorelines Administrator (360) 740-1487.

Title: Streambank Stabilization Committee - Outreach and Education (LCC 102)
Factor(s) for Decline: Decreased Channel and Floodplain Complexity, Riparian Areas and Wetland Degradation, Impaired Water Quality, Sediment Transport and Fine Sediments, Basin Hydrology and Stream Flow.
Description: The Lewis County Planning Division conducts their streambank stabilization program each spring and early summer of the year. This program is designed to educate and assist landowners on utilization of different bank protection techniques. Bioengineering techniques - bank barbs, large woody debris, bank sloping and revegetation (grasses, shrubs and trees) - are stressed over traditional riprap, dikes and revetments. This program is conducted jointly with representatives from the Washington Department of Fish & Wildlife, Washington Department of Ecology, Natural Resource Conservation Service and the Lewis County Public Works Division.
Timeframe: Annually.
Contact: Marc Duboiski, Shorelines Administrator (360) 740-1487 and/or Ed Oliphant, Special Projects Engineer (360) 740-1175.

Title: Preliminary Culvert Inventory for the Cowlitz River Watershed (LCC 103)
Factor(s) for Decline: Fish Access and Barriers to Passage.
Description: The Lewis County Public Works Division and the Planning Division conducted a preliminary culvert inventory for both the Lower Cowlitz watershed (below dams) and the Upper Cowlitz watershed (above dams). This inventory, conducted by county staff, identified culvert barriers (perched culverts) on all type 3 and 4 streams along county roads. The county identified 22 culverts (16 in the lower Cowlitz and 6 in the upper Cowlitz) that are barriers to fish passage with a cost estimate of $1.5 million for full replacement.
Timeframe: Completed. Will work with WDFW to prioritize identified culverts.
Contact: Marc Duboiski, Shorelines Administrator (360) 740-1487 and/or Ed Oliphant, Special Projects Engineer (360) 740-1175.

Title: Culvert Maintenance Program (LCC 104)
Factor(s) for Decline: Fish Access and Barriers to Passage

Description: The Lewis County Public Works Division conducts an annual culvert maintenance program for repairing and cleaning out all private and public culverts. This program's average annual expenditure within the Cowlitz River watershed is $72,000. This annual budget has been increased to $100,000.
Timeframe: Annually.
Contact: Bill Forth, Road Superintendent (360) 740-1384.

Title: Culvert Replacement Program (LCC 105)
Factor(s) for Decline: Fish Access and Barriers to Passage
Description: The Lewis County Public Works Division replaces culverts for the purpose of improving fish passage within the Cowlitz River watershed. Over the last two years, this program's average annual expenditure is $73,000. The county has increased this annual expenditure for improving fish passage to $100,000.
Timeframe: Annually.
Contact: Bill Forth, Road Superintendent (360) 740-1384 and/or Marc Duboiski, Shorelines Administrator (360) 740-1487.

Title: Development of Stormwater Management Ordinance (LCC 106)
Factor(s) for Decline: Riparian Areas and Wetland Degradation, Impaired Water Quality, Sediment Transports and Fine Sediments and Basin Hydrology and Stream Flow.
Description: The Lewis County Public Works Division is currently in the process of developing stormwater management regulations to be adopted to assist land development and road construction projects. This will allow greater flexibility in requiring and implementing the proper mitigation to limit the impacts of increased runoff from impervious surfaces to floodplains, wetlands and streams within the Cowlitz River watershed.
Timeframe: Completed by the end of 1999.
Contact: Shirley Kook, Senior Engineer, Surface Water (360) 740-2759.

Title: Adopt a Filling and Grading Ordinance (LCC 107)
Factor(s) for Decline: Decreased Channel and Floodplain Complexity, Riparian Areas and Wetland Degradation, Sediment Transports and Fine Sediments, Basin Hydrology and Stream Flow and Impaired Water Quality.
Description: The county will pursue the adoption of a filling and grading ordinance which would set forth the regulations to control excavation, grading and earth movement construction including fills and embankments, establishes the administrative procedure for issuance of permits; and provides for approval of plans and inspection of grading construction.
Timeframe: Completed by the end of 1999.
Contact: Dennis Sabin, Building Official (360) 740-1123.

Title: Adoption of a On-Site Sewage System Operation and Maintenance Program (LCC 108)
Factor(s) for Decline: Impaired Water Quality.

Description: The county will adopt a on-site sewage operation and maintenance program as per WAC 246-272. This program will establish maintenance and monitoring requirements for on-site sewage systems. This program will provide for performance evaluations of on-site sewage systems on a continued basis in order to control sources of non-point discharge of pollutants.
Timeframe: Completed by the end of 1999.
Contact: Jim Goode, Environmental Services Manager (360) 740-1238.

Title: Lewis County Goal/Vision Committee, Public Participation Plan for Initiating Watershed Planning (LCC 109)
Factor(s) for Decline: Decreased Channel and Floodplain Complexity, Sediment Transports and Fine Sediments, Basin Hydrology and Stream Flow, and Impaired Water Quality.
Description: Since early 1997, Lewis County has formulated and hosted four citizen advisory groups throughout the Cowlitz Watershed. These groups, which have meet met at least 30+ times, were organized to define goals and values for the watershed concerning five main topics - flood control, fisheries, economic development, recreation and culture/environment. This first step in the watershed planning process has provided the Commissioners with valuable, locally-driven goals for the future of the Cowlitz River. The next step is to form a watershed council for the Cowlitz.
Timeframe: Completed. A watershed grant application has been submitted to Ecology in 11/97.
Contact: Marc Duboiski, Shorelines Administrator (360) 740-1487.

Phase 2 Actions

Title: Comprehensive Culvert Inventory (LCC 200)
Factor(s) for Decline: Fish Access and Barriers to Passage
Description: A more comprehensive inventory with the Washington Department of Fish & Wildlife (WDFW) shall be completed. This inventory will require funding and staffing assistance from the WDFW. This inventory is intended to evaluate all culverts, their sizes, their installation, their gradient, the size of the drainage area upstream, the peak and off-peak stream velocities, the stream bedload, the upstream and downstream habitat value and the existing natural fish barriers. All identified problem areas shall be prioritized for implementation using a benefit/risk analysis. Multiple funding sources shall be sought out for full implementation.
Timeframe: Completed by the end of 1999.
Contact: Marc Duboiski, Shorelines Administrator (360) 740-1487 and/or Ed Oliphant, Special Projects Engineer (360) 740-1175.

Title: Priority One Culvert Replacement Program (LCC 201)
Relevant Factor(s) for Decline: Fish Access and Barriers to Passage.

Narrative Description: Nine culverts have been prioritized at a priority one level. These nine are from the preliminary culvert inventory outlined under our phase I actions. All culverts are in the Lower Cowlitz Watershed and the preliminary cost estimates for total replacement of these barriers is $995,000. Additional funding sources are required to correct all nine barriers.
Timeframe: Completed by the end of 1999.
Contact: Ed Oliphant, Special Projects Engineer (360) 740-1175.

Title: Implementation of the Filling and Grading Ordinance (LCC 202)
Relevant Factor(s) for Decline: Decreased Channel and Floodplain Complexity, Sediment Transports and Fine Sediments, Basin Hydrology and Stream Flow and Impaired Water Quality.
Narrative Description: After adopting a filling and grading ordinance which would set forth the regulations to control excavation, grading and earth movement construction including fills and embankments, establishes the administrative procedure for issuance of permits; and provides for approval of plans and inspection of grading construction. Additional funding resources will be required for hiring additional staff to implement this permitting process.
Timeframe: Completed by the end of 1999.
Contact: Dennis Sabin, Building Official (360) 740-1123.

Title: Implementation of the On-Site Sewage Operation and Maintenance Program (LCC 203)
Factor(s) for Decline: Impaired Water Quality.
Description: The county will implement their on-site sewage operation and maintenance program as per WAC 246-272. This program which establishes maintenance and monitoring requirements for on-site sewage systems, will provide for performance evaluations of on-site sewage systems. These evaluations are conducted on a continued basis in order to control sources of non-point discharge of pollutants. Additional funding resources will be required for hiring additional staff and for developing the software tracking system.
Timeframe: Completed by the end of 1999.
Contact: Jim Goode, Environmental Services Manager (360) 740-1238.

Title: Comprehensive Flood Hazard Management Plan (CFHMP) for the Cowlitz Watershed (LCC 204)
Factor(s) for Decline: Decreased Channel and Floodplain Complexity, Riparian Areas and Wetland Degradation, Sediment Transports and Fine Sediments, Basin Hydrology and Stream Flow, and Impaired Water Quality
Description: The county is currently pursuing funding from the Department of Ecology, through Flood Control Assistance Account Program (FCAAP), to prepare a CFHMP for the Cowlitz Watershed. This plan will also be conducted in cooperation with Cowlitz County, the U.S. Forest Service and Tacoma Public Utilities. This plan will address flood issues, analyze problems, and make both structural and non-structural recommendations to alleviate these problems.

Timeframe: Completed by the end of 2001.
Contact: Marc Duboiski, Shorelines Administrator (360) 740-1487.

Title: Cowlitz River Watershed Planning Grant Application (LCC 205)
Factor(s) for Decline: Decreased Channel and Floodplain Complexity, Riparian Areas and Wetland Degradation, Sediment Transports and Fine Sediments, Basin Hydrology and Stream Flow, and Impaired Water Quality.
Description: In November of 1997, Lewis County submitted a watershed planning grant application to the Department of Ecology for $50,000. This money will be used to establish a watershed council on the Cowlitz River. This council will be used as a regional advisory and educational body concerning water issues throughout the basin. The purpose of this regional body will be to assist local jurisdictions, with the best available science, develop consistent policies, procedures and regulations within the watershed. The three main areas to be evaluated are water quality, water quantity, and fish and wildlife habitat.
Timeframe: Grant submitted in 11/97. Funds should be dispersed by Spring 1998. Watershed Council should be set up and running by FY 98-99 biennium.
Contact: Marc Duboiski, Shorelines Administrator (360) 740-1487.

Organization: City of Ridgefield

Phase 1 Actions

Title: Improvements to Gee Creek (RDG-101)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation, Sediment Transport
Description: Actions taken by the City of Ridgefield in the last few years to improve Gee Creek include:

- Sensitive Lands Ordinance that restricts development near stream tributaries and encourages replanting of riparian habitat.
- Zoning restrictions on development of steep slopes with no building on slopes over 25%.
- Gee Creek restoration group formed in 1991 and over $100,000 in grants and projects accomplished, including:
  - Fencing stock animals away from creeks.
  - Replanting 16,000 trees in creek riparian areas.
  - Burying manure lines for dairies to minimize spills from freezing.
  - School supplies for watershed education in schools.
  - Yearly watershed education in 5th, 7th and 8th grades.
  - High school senior projects on riparian area and watershed education.
  - Two new bio swales on road projects for storm drainage.
- Educational signs in city park depicting the health of Gee Creek and how citizens can help.

Contact: Tevis Laspa, Mayor (360) 887-3557

Organization: Skamania County Planning Department

Phase 1 Actions

Title: Columbia River Gorge National Scenic Area Ordinance (SKP-101)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation, Decreased channel and Floodplain complexity, Fish access and barriers to passage
Description: Approximately 50% of Skamania County's entire private land base adjacent to the Columbia River (87,352 acres) is within the Columbia River Gorge National Scenic Area. In December of 1993, Skamania County began implementation of its National Scenic Area Ordinance in compliance with the Columbia River Gorge National Scenic Area Management Plan. The County's National Scenic Area Ordinance has specific regulations regarding land use designations, protection of fish and wildlife habitat and water resources. An entire chapter was created to enforce strict regulations in sensitive wildlife areas. Such regulations include:

- Limiting development to specific areas on a parcel,
- Limiting the amount of disturbance to an area by restricting the amount of tree and vegetation removal,
- Requiring a wildlife management plan to be completed and reviewed by the Planning Department in conjunction with the Washington Department of Fish and Wildlife,
- Prohibiting development altogether in some areas,
- For commercial development, wildlife surveys are required to record new information on parcels that may have not previously been seen as sensitive wildlife areas, and
- Restricting the types of fencing landowners can build in deer and elk winter range.

An additional chapter is devoted to water resource regulations for streams, lakes, ponds and wetlands. Buffer areas for wetlands, lakes and ponds are specifically stated in this chapter depending on the types of vegetation surrounding a particular wetland (i.e. forest, shrub, herbaceous). Buffer areas around streams and rivers are regulated by the size (i.e. perennial or intermittent). For example, buffers around perennial streams in the General Management Area are 100 feet and buffers around intermittent streams in the General Management Area are 50 feet. All water resources are also regulated by the zoning they are located in. Water resources within the Special Management Area of the National Scenic Area have wider buffer areas while water resources within the General Management Area of the National Scenic Area are less restrictive. Variances to buffer requirements may be allowed in certain cases with the completion of a water resource mitigation plan that states that no adverse impacts to water resources will occur and identifies mitigation measures to reduce or eliminate impacts to water resources from the proposed development.

Land use designations and zoning requirements established with the enactment of the Scenic Area limits development in a manner consistent with the sensitivity of lands and with existing development in the Columbia River Gorge. All lands within the Special Management Areas (Forest, Agriculture and Open Space) cannot be divided. Sensitive lands in the General Management Area were given large minimum lot sizes such as Small Woodland and Small scale Agriculture minimum lot size of 20 acres. Large scale Agriculture – 40, 60 or 80 acre minimum lot sizes, Large Woodland, Open Space and Commercial Forest lands were not given minimum lot sizes as no land divisions are allowed. All of these zoning regulations were established based upon impacts to scenic, cultural, natural and recreational resources.

The National Scenic Area Ordinance also requires enrollment in the state's Current use and Classified Forest lands assessment's program in some areas. These programs include special tax incentives for owners of Forest and Agricultural lands, if they maintain the land as forest land. These incentives were established to try and persuade land owners not to develop potentially valuable resource lands. Once developed or taken out of "current use" or "classified forest or agricultural" status, back taxes would have to be paid. The threat of the liability of back taxes serves to keep these resource lands in resource use.

The key aspect of the National Scenic Area Ordinance is to "protect and provide for the enhancement of the scenic, cultural, recreational, and natural resources of the Columbia River Gorge; and…" which includes specifically the protection of wildlife and water resources.
Contact: Skamania County Planning Department (509) 427-9458

Title : Skamania County Critical Areas Ordinance (SKP-102)
Relevant Factors for Decline: All Factors
Description: Skamania County's Critical Areas Ordinance (CAO) was passed in December of 1996 and became effective July of 1997 and regulates areas identified as watershed protection areas including wetlands, ponds, lakes, streams, creeks and rivers, fish and wildlife areas and geological hazardous areas in order to reduce adverse impacts to important resource areas within our County as development pressures increase. This Ordinance was developed as required by the state's Growth Management Act. The idea of the CAO is to place additional buffers and require additional studies within specific areas prior to building permit approval so damage and remedial costs are limited.
Contact: Skamania County Planning Department (509) 427-9458

Title: State Environmental Policy Act (SEPA) Ordinance – SEPA Rules (SKP-103)
Relevant Factor for Decline: Basin hydrology and Stream flow, Ecological Interactions influenced by human activities, Loss of genetic diversity, Decreased channel and Floodplain Complexity.
Description: SEPA was first adopted in 1971 with the basic purpose of directing agency decision makers into having sufficient information in order to make appropriate decisions which directly effect the environment. SEPA gives agency decision makers the ability to modify development that would adversely affect the environment by establishing mitigation measures for specific types of development depending on the size of the development and its impact to natural resources. If the agency is not sure what type of mitigation measures are appropriate, it may require additional information. If a development will have a likely adverse impact to the environment, then an Environmental Impact Statement (EIS) is required prior to development. Skamania County, when the lead agency for SEPA, routinely addresses and implements mitigation measures for development that falls under SEPA regulations.
Contact: Skamania County Planning Department (509) 427-9458

Title: Comprehensive Plan "A" (SKP-104)
Relevant Factor for Decline: All factors
Description: Skamania County's Comprehensive Plan was approved in 1977 and its main purpose was to set out desirable long-term goals for land use development. The ideas represented in the Comprehensive Plan stated that future development should occur in a manner that suits the natural qualities of the Columbia River Gorge such as forest lands, water and wildlife resources. The plan is very basic but provides an important consensus from Skamania County citizens on how development should take place. A sub-area Comprehensive Plan was recently adopted for the Carson Area in December of 1997. Carson includes about four square miles of the most densely populated area of the County.
Contact: Skamania County Planning Department (509) 427-9458

Title: Skamania County Zoning Ordinance (SKP-106)
Relevant Factor for Decline: Ecosystem/ecological interactions, Basin Hydrology and Stream flow
Description: Skamania County's Zoning Ordinance was passed in 1985 and amended in 1992. It was created from the ideas and goals expressed in the County's Comprehensive Plan but addresses zoning regulations more specifically. The general zones identified in the Comprehensive Plan are broken down even further to address specific types of development that can or cannot occur within certain areas. Zones were created based on existing development, the desires of Skamania County citizens and natural features. Similar to the Comprehensive Plan, the County adopted a sub-area zoning ordinance for Carson in December 1997.
Contact: Skamania County Planning Department (509) 427-9458

Phase 1 and 2 Actions

Title: Shoreline Management Act Permit Ordinance – Shoreline Management Master Program (SKP-107, Phase 1)(SKP-201, Phase 2)
Relevant Factor for Decline: Riparian Areas and Wetland Degradation, Basin Hydrology and Stream flow, Impaired Water Quality, Decreased Channel and Floodplain Complexity
Description: Skamania County adopted a Shoreline Management Master Program in June 1974 with the latest revisions occurring in July of 1986 to comply with the state's Shoreline Management Act. The main purpose of the Master Program is to manage Washington shorelines that is consistent with the Management Act and reflects the interests and goals of the County's citizens. The Master Program addresses all appropriate uses within the shoreline area, which extends back 200 feet from the ordinary high water mark of various rivers, streams and lakes. Regulations were enacted to enhance shoreline areas, not restrict them. The following goals address requirements from the Skamania County Shoreline Management Master Program:

- Preserve natural shoreline character where possible.
- Protect shoreline ecology and resources.
- Recognize and protect private property rights consistent with public interest.
- Provide public recreation opportunity along shorelines.
- Preserve and protect fragile natural resources and culturally significant features.
- Establish criteria for orderly residential growth.
- Promote reasonable and appropriate use of the shorelines which will promote and enhance public interest.
- Maintain a high quality of environment along shorelines.
- Protect shorelines against adverse effects to public health, land, vegetation, wildlife, and water and aquatic life.
- Maintain the state water quality classification on all shoreline water bodies.
- Protect public right of navigation.

In late 1998, Skamania County is planning on updating its Shoreline Master Program, however, as in other Washington counties, we are waiting for direction from the Washington State Department of Ecology before we begin updating the Master Program. This type of project could take up to two years to complete.
Contact: Skamania County Planning Department (509) 427-9458

Title: Rock Cove Environmental Evaluation and Comprehensive Plan (SKP-108, Phase1)(SKP-202, Phase 2)
Relevant Factor for Decline: Ecological Interactions influenced by human activities, Impaired Water Quality, Sediment Transport and Fine Sediments, Basin Hydrology and Stream flow.
Description: This plan was finalized October 30, 1997 and was conducted to provide information on the Rock Creek area to Skamania County in order to make

decisions on land use opportunities in that area while protecting its valuable natural resources and still provide economic opportunities. Rock Creek contains steelhead and salmon runs and Rock Cove serves as a rearing area for juveniles. The study brought forth valuable information for the County to further use this valuable resource. Six goals specifically related to natural features were defined in the final plan:

- Create additional fish and wildlife habitat to improve habitat diversity in Rock Cove.
- Protect Rock Cove and Rock Creek Water Quality.
- Protect and Enhance Important Fish and Wildlife Habitats in Rock Cove and Rock Creek.
- Protect Rock Creek and Rock Cove stream banks from erosion damage.
- Improve and maintain flood flow conveyance in lower Rock Creek.
- Protect and Enhance the Natural Appearance of the Cove

Beginning in March of 1998 and ending in December of 1999, the following high priority actions will be looked at:

- Remove all or a portion of the accumulated rock and sediment upstream and downstream of the Rock Creek Drive bridge to the highway bridge.
- Explore public/private partnerships as alternatives/leverage for funding.
- Identify areas of streambank erosion (existing and potential) that pose problems for properties or structures and implement bank protection measures, using biotechnical or other appropriate environmentally sensitive techniques to the extent feasible.
- Use biotechnical and landscaping techniques to protect cove shorelines from erosion, and improve habitat and aesthetic values, particularly on the east end.
- Create emergent marsh habitat at selected locations on cove shoreline.

Contact: Skamania County Planning Department (509) 427-9458

Title: Skamania West End Water Quality Study (SKP-109, Phase1)(SKP-203, Phase2)
Relevant Factor for Decline: Impaired Water Quality, Sediment Transport and Fine Sediments
Description: Because of the growth occurring in Clark County, the west end of Skamania County, has seen a dramatic increase in development pressure. Most residents of the west end use individual withdrawals of surface and ground water to supply their homes and rely on septic systems. Many Skamania County residents were concerned that with increased development water quality may be affected and expressed a strong need that a study on water quality and quantity be conducted. The west end of Skamania County is the drainage basin for the Washougal River. The Washougal River and its tributaries are important spawning grounds for coho and chinook salmon and wild steelhead among other aquatic species. In the past years, declines in the above fish populations have also caused the need to look at the quality and quantity of water resources in the Washougal River Basin. In

September of 1997, the West End Water Quality Study was completed with the above mentioned concerns in mind. The study objectives were:

- Develop a database to store water resource and water quality data for future assessments and resource management decisions,
- Characterize water resource conditions within the watershed relative to water quality criteria and critical indicators of resource availability,
- Establish a monitoring network for assessing trends in quality and quantity parameters over time, and
- Establish empirical understandings from which growth regulations, land use and future development planning will be guided.

The main objective for Skamania County in completing this study was to create an informational database that allows decisions on residential and commercial growth and effects on natural resources be monitored so as not to allow development impacts to adversely effect existing residents in the area and wildlife and water resources.

Beginning in the summer of 1998, Skamania County, in a joint effort with Clark County, will be organizing an Upper Washougal River Watershed Council with residents of Clark and Skamania Counties to focus on conservation and restoration factors relating to the decline of the wild steelhead decline.
Contact: Skamania County Planning Department (509) 427-9458

Organization: Underwood Conservation District

Phase 1 and 2 Actions

Title: Wind River Watershed Project (UCC-101, Phase1)(UCC-201, Phase 2)
Relevant Factor for Decline: Impaired Water Quality, Riparian Areas and Wetland Degradation, Fish Access and Barriers to Passage
Description: The Wind River Watershed Project was started through the Underwood Conservation District as an attempt to preserve, protect and restore the Wind River steelhead and the health of the Wind River watershed. The UCD applied for and received a $30,000 grant from USFW to start collecting data about the watershed in order to assess problems and prioritize specific watershed problems identified. To date the Wind River Watershed Project has made the following progress on an inventory for the Lower Wind River Basin:

- A Wind River technical committee was initially organized in December of 1996. The group is composed of representatives of the USFS Mt. Adams RD, USFS – CRGNSA, USF&WS, Skamania County, UCD, DFW, DNR, USGS and NWSA.
- The entire basin has been mapped by ownership. Acreages have been tabulated according to landowner classification (i.e., USFS, DNR, large timber companies, large scale private and small scale private).

- The watershed has been mapped according to general land-use categories. All current WEP projects have been mapped.
- UCD staff has initiated collection and organization of all known water quality data/ interpretation pertaining to the Wind River system. Approximately one-half of this task is presently completed.
- The UCD and cooperators have completed 18.8 miles of the currently planned stream and riparian zone surveys within the basin.
- The UCD has organized an updatable watershed enhancement project (WEP) database. Forty enhancement projects have been documented to date.

Also part of the Wind River Watershed Project was to form a Wind River Action Committee (AC) in order to identify public concerns and ideas for restoration of the Wind River Watershed. As of January 6, 1998, eight meetings have been held. The AC was originally formed in June of 1997 and by the end of September the group successfully defined project goals, elected officers, established a WEP project ranking process, adopted a consensus approach for decision-making, and initiated "watershed stakeholder presentations" as a feature of each meeting.
At the latest meeting held on January 6, 1998, of the forty enhancement projects documented, ten had been rated top priority with the top two being financially feasible with the amount of money that the UCD currently has in its budget for the Wind River Watershed Project.
The UCD has just completed a grant application to the Bonneville Power Administration requesting additional funding for the Wind River Watershed Project in order to complete more of the top priority enhancement projects identified by the Wind River technical committee and the Wind River Action Committee. Also, at the January 6, 1998 meeting, information was given by the Department of Ecology on additional grants that may be attainable and the Wind River Action Committee and UCD will be looking at those grant applications along with Skamania County.
Contact: Underwood Conservation District, Steve Tampfli (509) 493-1936

Organization: Vancouver-Clark Parks and Recreation Department

Title: Acquisition of Open Space Areas (VCP-101)
Purpose: Protection of important rivers and associated flood plains, wetlands, and upland areas.
Description: This is a program to acquire high priority open space areas for the purpose of preserving and enhancing their important open space and habitat values. In 1985 Clark County adopted a 6 ¼ cents per $1,000 assessed value property tax (called "Conservation Futures") to acquire high priority open space, agricultural, and forestry lands. In 1990, a citizen Open Space Commission identified priorities for acquisition under this program. The Open Space Commission considered priority fish and wildlife habitat in establishing these priorities. The priorities focus on acquisition of important shoreline and floodplain areas along the major water bodies in Clark County. Since 1985, Conservation

Futures has funded acquisition of approximately x,xxx acres and yy miles of shoreline along the Columbia River, the Washougal River, Lacamas Creek, Burnt Bridge Creek, Salmon Creek, Cougar Creek, the East Fork of the Lewis River, and the North Fork of the Lewis River. Under state and county code, these lands must be managed to protect the important open space benefits.

Phase 1 Action: The Clark County Board of Commissioners recently initiated a new project application session to fund additional Conservation Futures projects. These projects will be presented to the Board of Commissioners at a December 9, 1997 public hearing. The project applications include over x,xxx acres and yy lineal feet of important shoreline and floodplain areas, valued at over $19 million. The Board of Commissioners will have an opportunity to 1) fund projects from existing revenues; 2) fund projects from Conservation Futures bonds; or 3) fund projects from other funding sources.

Phase 2 Action: The state legislature and local governments could increase the statutory limit for the Conservation Futures tax, thus making more funds available for direct acquisition and protection of critical habitat areas.
Contact: Glenn Lamb, (360) 735-8839

Title: Restoration of Riparian Areas (VCP-102)
Purpose: Restoration of important riverbanks and associated floodplains, wetlands and uplands.
Description: This is a program to restore high priority habitat areas for the purpose of enhancing the functional integrity of habitats needed to support fish and wildlife populations. Clark County funds and provides oversight of two Americorps volunteers who coordinate a tree planting and habitat restoration program within Clark County's x,xxx acres of conservation and greenway areas. Since June 1996, over xx,xxx trees and shrubs have been planted in high priority riparian corridors in order to provide additional stream shading to lower stream temperatures and improve fish habitat.
Phase 1 Action: The Clark County Board of Commissioners will continue to provide funding for this position. Clark County recently was awarded a $yy,yyy grant from the (Portland, OR) Metropolitan Greenspaces program for tree plantings along the East Fork of the Lewis River in 1998. In addition, the county will pursue tree planting opportunities with the private non-profits "Friends of Trees" and "Habitat Partners" groups.
Phase 2 Action: The Clark County Board of Commissioners will continue to fund and support this program in future years.
Contact: Tim Haldeman, (360) 735-8840

Title: Restoration of Wetlands (VCP-103)
Purpose: Restoration of historical agricultural areas in high-quality wetlands.

Description: This is a program to restore high priority wetlands areas that historically were drained and used for agricultural purposes. Under the federal Wetlands Reserve Program, the county will agree to restore wetlands to high quality wetlands in exchange for federal cost-sharing of the restoration costs.
Phase 1 Action: The Clark County Board of Commissioners will review specific project proposals for possible participation in the Wetlands Reserve Program. Where appropriate, the county will agree to restore such wetland areas to provide habitat benefits.
Phase 2 Action: The Clark County Board of Commissioners will continue to seek opportunities through this program in future years.
Contact: Glenn Lamb, (360) 735-8839

Title: IAC Grants for Acquisition of Open Space and Habitat (VCP-104)
Purpose: Protection of important rivers and associated floodplains, wetlands, and upland areas.
Description: This is a program to acquire high priority open space areas for the purpose of preserving and enhancing their important open space and habitat values. Under this program, Clark County applies for state Interagency Committee for Outdoor Recreation (IAC) grants to acquire and restore high priority open space and habitat lands. Since 1990, over $x,xxx,xxx has been secured to acquire such high priority open space and habitat areas, including properties along the Columbia River, the Washougal River, Lacamas Creek, Salmon Creek, the East Fork of the Lewis River, and the North Fork of the Lewis River. Under state grant requirements, these lands must be managed to protect their important open space benefits.
Phase 1 Action: The Clark County Board of Commissioners recently applied for additional grants, and will be submitting a grant application this winter for the IAC Habitat Restoration Program. When successful, Clark County will use these funds to acquire and restore high priority habitat areas.
Phase 2 Action: Clark County will continue to apply for state IAC grant funds for acquisition and restoration programs. In addition, the county will seek other private and public grant funds.
Contact: Glenn Lamb, (360) 735-8839

Organization: Wahkiakum Conservation District

Phase 1 Actions

Title: Grays River Watershed Planning and Implementation Project (WCD-101)
Relevant Factor(s) for Decline: Barriers, Channel Complexity, Riparian/Wetland, Sediment Transport, Water Quality, and Basin Hydrology
Description: Wahkiakum Conservation District is currently assisting the Grays River watershed community address their watershed issues and concerns. The project relies on a consensus building approach toward the development and implementation of a watershed plan. A consensus group made up of watershed

landowners, land managers, local government, and interest groups provide the decision making body for the project. Natural resource agencies are partnering in the approach to assist the consensus group assess resource conditions and make decisions based on sound science. The watershed communities issues and concerns focus on flooding, fisheries and water quality. The District has assisted the community identify their issues and concerns, compiled available information to convey historic and current conditions, and has begun field assessments in the watershed. Stream surveys have been completed on all the anadromous fish bearing water in the watershed. The survey includes identification of fish passage issues, physical characteristics of the stream, riparian conditions, fish habitat, large woody debris, channel stability conditions, and non point sources from upslope activities. Road and mass wasting assessments have been completed for two-thirds of the watershed. The road assessment is a survey of the entire road network including the traveled surface, cut and fill slopes, and culvert installations based on hydrologic segments. The mass wasting assessment includes a remote sensing review of past and present mass wasting features and a field survey of existing conditions. Additional assessment work will include forest management activities, agriculture management activities, surface erosion, and hydrology. Implementation activities have been ongoing as the field work progresses.
Contact: Darin Houpt, (360) 425-1880 or (360) 795-8240

Phase 2 Actions

Title: Grays River Watershed Plan Implementation (WCD-201)
Relevant Factor(s) for Decline: Barriers, Channel Complexity, Riparian/Wetland, Sediment Transport, and Water Quality
Description: Following the development of the Grays River watershed management plans as identified under phase I, the district intends to apply for funding to help the community implement their plan. The purpose of the plan is to develop site specific needs in the watershed, prioritize the needs, and develop the strategy to implement practices that will address the communities issues and concerns. Examples of practices based on current available information for the watershed include; correcting fish passage issues, improving riparian condition, critical area seeding (erosion control), instream structures to add to channel complexity and provide habitat, streambank stabilization, improved road drainage, road abandonment, improved pasture management, riparian fencing, alternative livestock watering, and improved forest practices.
Contact: Darin Houpt, (360)425-1880 or (360) 795-8240

IV. PRIVATE ORGANIZATION CONSERVATION ACTIONS

Many private organizations are taking action to protect and restore steelhead habitat in the LCSCI area. The brief descriptions provided below identify and describe a few of the actions of private organizations. As additional descriptions of current and proposed actions by private organizations are provided they will be incorporated into subsequent LCSCI documents.

Major stakeholders in forestry, port operators and hydropower utilities in the area have also organized to develop restoration measures. Conservation actions by the forest products industry, ports and utilities have been compiled in a report by S. P. Cramer & Associates (Cramer 1997). Excerpts from the report that describe these conservation actions are incorporated in this subsection.

This information represents part of a baseline of current and proposed actions to protect and restore steelhead and other salmonid habitat. The adequacy of individual actions and the overall adequacy of the entire package of state, federal, and local, as well as private actions in addressing the habitat factors for decline and protecting and restoring steelhead habitat cannot be fully evaluated until watershed assessments and management plans for each of the priority watersheds in the LCSCI area are completed.

Clark County Private Organizations

Organization: Lewis River Ranch, LLC

Purpose: Lewis River Ranch is a privately held natural resource based business. It manages its land for forestry, mining, and environmental stewardship purposes.
Description: Lewis River Ranch owns approximately 2 miles of shoreline on the East Fork of the Lewis River. It has engaged in various riparian restoration projects ranging from streamside planting, surface mining restoration, and fishery enhancement projects. Lewis River Ranch is currently working with the State Department of Fish and Wildlife on a high flow channel and fishery enhancement project that is anticipated to increase back water channel habitat for salmon and steelhead smolt. When complete, this project will cost over $15,000. In the past two years, Lewis River Ranch has planted over 5,000 trees converting former pastures and surface mining sites to forest. It has managed its land for fish and wildlife purposes and has been active in various fish and wildlife public policy processes.
Phase 1 Action: Complete the high flow channel and fishery enhancement project working the State Department of Fish and Wildlife in 1998. Complete experimental restoration plantings (1997-98).
Phase 2 Action: Riparian area plantings in select backwater channel areas along the shoreline of the East Fork. Develop and monitor data collected from experimental restoration sites. Research outdoor education partnership program.

Contact: Kent Landerholm, Manager, (360) 693-6100

Organization: Pomeroy Living History Farm

Farm Promotes Responsible Land Stewardship

Pomeroy Living History Farm sits nestled among tall firs in the foothills of the Cascade Mountains in northern Clark County, Washington. The Farm is an interactive educational museum that depicts domestic and farm life from both the early 20th century and modern perspective.

This National Register of Historic Properties farmstead includes the Pomeroy's six bedroom log home built in 1920, a working blacksmith shop, barn, extensive herb and vegetable gardens, pastures and timberland. The Farm utilizes living history as an interpretational technique to share with school children and the general public about both pre-electrical and modern farmlife.

School children explore the Farm through half day field trip programs, each tailored to the educational development of specific grade levels. 20 page curriculum packets with pre and post visit activities accompany each program to expand the field trip experience into the classroom.

The Farm's newest educational program "Birds, Critters, and Trees" is the result of a partnership with local farm foresters. Designed for fourth through sixth graders, and taking place out in the woods, the program combines environmental education with a tree farmer's perspective of how to provide the wood products our society needs with responsible land, water, and wildlife stewardship. Approximately 500 students a year visit the Farm for this field trip experience.

Pomeroy Living History Farm is a not-for-profit, 501 C 3, public benefit educational museum.

Organization: Pomeroy Plowman Ranch

Small Private Timberland Owners Practicing Responsible Stewardship

Pomeroy Plowman Ranch is a fifth generation cattle and timber farm located in northern Clark County. The farm has about 600 of its 677 acres in timber and wildlife management.

Farm manager and president, Bob Brink, concerned that small private timberland owners like himself, have been inappropriately accused of causing environmental degradation, has been pro-active in promoting responsible land stewardship and best management practices on his tree farm.

In 1986 the Farm became a Certified Tree Farm. In 1993 Mr. Brink was selected as the Clark County Tree Farmer of the year. In 1994 he was selected as the Southwest Washington Regional Tree Farmer of the Year and was a finalist for the 1994 State Tree Farmer of the Year award.

In 1994 the Pomeroy Plowman Ranch created the first small landowner alternative management plan as permitted in the state of Washington's Forest Practices Act. This management plan was reviewed and accepted as meeting or exceeding all

Forest Practice Requirements by the Departments of Ecology, Fish and Wildlife, the Department of Natural Resources and the Native American Tribes.
Pomeroy Plowman Ranch is currently working with the U.S. Fish and Wildlife Service in creating a small landowner's Habitat Conservation Plan for the Farm. The USFWS was concerned that present Endangered Species Act enforcement was creating a disincentive for small private landowners to maintain or create suitable endangered species habitat.
Mr. Brink was willing to enter into a voluntary venture with the USFWS to create a pilot HCP that could then be mimicked by other small landowners around the state.
Mr. Brink is an active member and past president of the Clark County Farm Forestry Association which has over 250 members. Many members operate tree farms that, like Mr. Brink's, have been in their families for generations. It is hoped that his pilot HCP can be utilized by many of these landowners who are already practicing responsible forestland stewardship, but are wary of the current consequences of creating habitat for, and attracting endangered species.

Organization: Fish First

Description: Fish First is a 501c3 non-profit organization that began on June 22, 1995. We act with the common goal of improving the quality and increasing the numbers of fish in the Lewis River and all its tributaries. Our mission statement is "More and better fish in the Lewis River with no politics." We have a coalition of big and small businesses, government groups, fisheries, fish enhancement groups and all other interested parties to bring back the Lewis River and tributaries to their fullest potential.
Accomplishments include:

- Seven net pens operating in the North Fork that finished 154,000 spring Chinook and 60,000 steelhead.
- Cleaned up the river after the February 1996 flood.
- Two banquets, auctions raised over $74,000.
- Habitat project on Cedar Creek, at Pigeon Springs, involved over 400' of bank restoration and spawning enhancement.
- We are actively involved in culvert removal or modification where fish passage is impeded.
- Cedar Creek drainage is mapped into 7 reaches with leaders to work with landowners for habitat restoration.

Future: Private landowners will determine our success. Fish First will act as a "go between" for landowners and agencies, and will supply funds, material and labor for project completion. We have 100% volunteer members and officers. The beneficiaries or our effort will be the fish, the stream, our children and grandchildren.
We solicit the participation and involvement of everyone to work toward our mission statement, goals and strategies for our success. We currently have over 360 members.

Contact: Jack Kaeding
3712 SW Sandpiper Dr.
Woodland, WA 98674
(360) 225-5651

Organization: **Habitat Partners**

Purpose: Develop broad-based partnerships that support coordinated planning and implementation of habitat preservation and enhancement.
Description: Habitat Partners is a broad-based partnership of businesses, private nonprofits, school groups, and government agencies that work together to preserve and enhance fish and wildlife habitat in Clark County and the lower Columbia region by promoting outdoor education, restoring and improving habitat sites, supporting priority land acquisitions, and otherwise encouraging activities that help sustain our quality of life through the preservation of wildlife habitat and populations. Habitat Partners was founded on the premise that broad-based community partnerships are an essential element in successful, long-term habitat preservation and enhancement. The organization met for the first time in May 1996. The organizing members included 17 private nonprofits, businesses, and governmental agencies which had some interest in habitat preservation and enhancement. The fall 1997 membership included 65 groups, agencies, families, and individuals, with a 20-member board of directors. Habitat Partner's range of interest extends throughout the lower Columbia region, and includes both sides of the Columbia River.
Phase 1 Action: The Habitat Partners Board of Directors established organizational goals in February 1997. The group's resources and energy generally focus on four areas: acquisition (Habitat Partners is not itself directly involved with the acquisition of property, but the group does support the acquisition of land by member organizations.), habitat enhancements, outdoor education programs, and public information.
Phase 2 Action Plan: Habitat Partners served as primary sponsor of three habitat enhancement projects from October 1996 - October 1997. Each project involved planting between 650 and 800 wetland trees and shrubs, and each project involved between 35 and 45 volunteers. Two of these projects occurred on the East Fork Lewis near La Center; the other project occurred on the Enchanted Acres wildlife preserve about three miles north of Camas. Habitat Partners will serve as primary sponsor for at least two enhancement projects each year, and will co-sponsor many other projects, in cooperation with member organizations. In 1998, Habitat Partners will implement its outdoor education partnership program; Habitat Partners has received $6,500 in grant funds to assist with this program. This program supports existing school-based outdoor education clubs and programs. School groups identified for participation in 1998 include the La Center Wetlands Club, Columbia River High School Science Club, and Fircrest Elementary 6th grade classes.
Contact: Bill Dygert, President, (360) 696-1388.

Organization: The Environmental Enhancement Group

Purpose: Restoration of orphan mined lands.
Description: The Environmental Enhancement Groups is a private/nonprofit organization that formed in 1994 to acquire and restore abandoned mining sites. As an initial project, the Environmental Enhancement Group acquired a 125-acre abandoned gravel mine on the East Fork of the Lewis River approximately three miles upstream of the city of La Center. The Enhancement Group is currently working with the State Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, Clark County, and other resource agencies to develop reclamation strategies for this river-front property, which is known as the Lewis River Preserve. Over time, the Environmental Enhancement Group hopes to acquire and reclaim other abandoned mining sites for the purpose of restoring and enhancing fish and wildlife values.
Phase 1 Action: The major focus of current activities is the reclamation of the 125-acre Lewis River Preserve on the East Fork of the Lewis River. The Enhancement Groups has drafted reclamation strategies and is now applying for funds to assist with restoration projects.
Phase 2 Action: The Enhancement Group will identify mining sites in addition to the Lewis River Preserve that are in need of reclamation. The long-term vision of the Enhancement Groups is to acquire and restore multiple sites in the lower Columbia region.
Contact: Bill Dygert, (360) 696-1388
Jeff Wriston, (360) 254-7770

A. FOREST PRODUCTS INDUSTRY MEASURES

Timber industry measures related to Washington are provided in the following section A-1. Pulp and paper industry measures are provided in section A-2. Measures are designated beginning with an abbreviation of the agency or industry type, followed by the number of the measure, followed by an E, P, S, or O, indicating whether the measure is intended to provide enhancement, protection, support, or other benefits (Cramer and Willis 1997). The abbreviations that are used for agency or industry type are as follows:

TIW - Timber Industry in the State of Washington
PPI - Pulp and Paper Industry

A-1 *Washington State Timber Industry Measures*

Following is a summary of information regarding timber industry programs, practices, and regulations in Washington. These programs and regulations constitute a diverse and extensive set of measures that contribute to the future protection, restoration, and enhancement of freshwater habitat for steelhead in Washington subbasins of the LCR Steelhead ESU.

TIW 1 - P - *Washington Forest Practices Rules*

Protections offered by Washington Forest Practices Rules and other related laws are presented in Appendix C. In summary, they include the following:

FR1--General Provisions covering implementation, monitoring and enforcement.

FR3--Rules Relating to Large Woody Debris including riparian zone protection on both fish-bearing and non fish-bearing streams, wildlife reserve tree requirements (which are usually placed in riparian areas subject to spacing requirements), and shade requirements.

FR4--Rules Relating to Temperature, including specific shade rules, wetland protection, and reforestation requirements.

FR5--Rules Relating to Coarse Sediments. Protection of slide-prone areas, road and landing design and construction standards, road maintenance and abandonment requirements, culvert and bridge standards, logging system requirements, riparian zone protection, wetland protection, wildlife reserve trees, and controls on site preparation.

FR6--Rules Relating to Fine Sediments with emphasis on road and landing design, construction, maintenance, and acceptable logging systems.

FR7--Rules Relating to Nutrients and Chemicals. Controls on application, handling, and storage of chemicals. Labeling and licensing requirements. Riparian zone and wetland protection.

FR8--Rules Relating to Water Flows. Clearcut size and greenup requirements. Rain-on-Snow precautionary requirements, road and landing design, related construction and maintenance requirements, equipment limitations, and wetland protection.

FR9--Rules Relating to Fish Passage. Requirement of obtaining a hydraulics permit for in-stream work. Culvert size and installation requirements to ensure adequate fish passage. Related road and landing design, construction, and maintenance requirements.

FR10--Hydraulics Code Relating to Forest Practices. This rule ensures effective fish passage for all stream crossing structures. Its provisions protect streams (including headwaters streams) from disturbance affecting the productivity of fishes, and provide for continuing recruitment of large woody debris.

FR11--Shoreline Management Act. This rule adds riparian zone protection within 200 feet of any "shorelines of state-wide significance," which includes all larger, fish-bearing streams.

FR12--Growth Management Act protects sensitive areas on forest lands that are being converted to residential or other uses.

Many of the rules referred to above were not adopted until 1992. As a result, their significance regarding protection and enhancement of habitat important for the production of fishes has not yet been realized. These measures will play an important role in reversing past trends concerning loss of habitat, and reduction in steelhead production capacity.

Rules enacted since 1992 include:

- Clearcut size and greenup rules that regulate the size and proximity of clearcuts.
- the Rain-on-snow rule.
- Stream temperature rules requiring that more trees be left in riparian buffers to provide shade.
- Wildlife tree rules that provide trees which are generally placed along streams. This usually results in widening of riparian buffers along fish-bearing streams or in adding buffers along non fish-bearing streams.
- Wetland protection rules.
- Strengthened chemical use rules.
- Protection of steep and unstable slopes.
- Rules protecting T&E fish and wildlife (e.g., spotted owl, marbled murrelet, etc.).
- The Watershed Analysis planning process.

Also, in 1997 the Forest Practices Board adopted an emergency "stream typing rule" that classified all unsurveyed streams from their mouth all the way up to areas of 20% gradient and 2 feet between high water marks as fish-bearing waters. This greatly expanded the stream network requiring protective riparian buffers, and adequate fish passage.

TIW 2 - P - *Washington's Watershed Analysis Process*

Protections offered by the Watershed Analysis process in Washington is summarized below:
FR2—The Watershed Analysis Process. This process is used to develop mandatory site-specific prescriptions, in addition to standard requirements, for steep and unstable slopes, for riparian protection, for control of surface erosion, for concerns regarding hydrology, and for protection of water quality. Resulting timber harvest plans include comprehensive road designs, construction and maintenance plans, and area enhancements such as removal of fish passage blockages. Examples of these analyses include:

FWA4--Connelly Creek Watershed Analysis
FWA5--East Fork Tilton Watershed Analysis
FWA10--Kiona Watershed Analysis
FWA11--Kosmos Watershed Analysis
FWA44--Upper Coweeman Watershed Analysis

These analyses are conducted on state and privately owned forest lands, and are in addition to federal Watershed Analysis Reports prepared by the U.S. Forest Service for federal forest lands.

Washington Department of Natural Resources (WDNR) is required to conduct watershed analyses for all of the forested watersheds in the state. There is no deadline, however, for completion of analyses, and WDNR is underfunded for this work. As a result, private landowners are conducting the majority of these analyses.

There are about 800 total forested watersheds requiring analysis in the State of Washington. Land ownership in approximately 600 of these watersheds is comprised of 10% or more state and private lands. Federal lands comprise 90% or more of the ownership in the remaining watersheds. At the current rate, it will take about 30 years to complete watershed analyses for the entire state.

Some watersheds are of higher priority for watershed analysis than others. It seems reasonable that WDNR would increase the priority for watersheds located in the LCR Steelhead ESU area.

TIW 3 - P - *Habitat Conservation Plans*

Protection for watersheds is offered by Habitat Conservation Plans and other planning efforts that have been completed. Most of these plans have given consideration to the needs of both fisheries and wildlife resources. Examples of these plans include:

FLP1--Murray Pacific Corporation Habitat Conservation Plan for the Northern Spotted Owl.
FLP2--Murray Pacific Corporation Amendment to the Habitat Conservation Plan for the Northern Spotted Owl.
FLP5--State of Washington Habitat Conservation Plan.
FLP9--Lewis River Integrated Landscape Management Project.
FLP13--Northwest Forest Plan (applies to all U.S. Forest Service lands in the ESU).

TIW 4 - S - *Voluntary and Cooperative Measures*

Growing industry awareness and additional industry action regarding habitat protection is achieved through training and education programs such as those offered through the AF&PA's sustainable forestry initiative and the Washington Contract Loggers' Association's accredited logger training program. These programs help to keep industry participants informed of new developments and techniques for identifying and avoiding harmful practices.

A-2 *Pulp and Paper Industry Measures*

The Pulp and Paper Industry is highly regulated with regard to discharges from their production facilities. Consequently, this industry has continually taken substantive measures to comply with ever-increasing regulatory requirements. Following is a description of these ongoing programs and measures.

PPI 1 - P - *Pulp and Paper Water Quality Control Efforts and Environmental Effects*

This measure includes the industries water quality control efforts relating to both conventional pollutants and dioxins, furans, and chlorinated organics. An assessment of the impact of specific pollutants and the implications for fish and the aquatic environment follows:

a. Conventional Pollutants

The pulp and paper industry has been a major industrial presence on the Columbia River for over 100 years. Today there are 14 pulp and paper mills on the Columbia River system, including the Snake and Willamette Rivers. Seven of these mills are bleached kraft mills and the remainder are unbleached mills.

The mills are regulated under the Clean Water Act and are required to obtain NPDES permits. By volume, the NPDES permitted discharges represent approximately half (52%) of the total volume of discharges from all permitted sources to the Columbia River; however the total volume of permitted discharges represents less than 2% of the discharge from the five largest lower Columbia River tributaries and less than half of 1% of the total annual flow of the Columbia River.

The NPDES permitted discharges of the pulp and paper industry are highly regulated. During the 1970's and 1980's, water pollution control efforts concentrated on installing secondary treatment systems to address conventional parameters such as total suspended solids (TSS) and biological oxygen demand (BOD), which are now controlled over 98%. Although not specifically designed to reduce trace quantities of toxics, secondary treatment systems have the added benefit of reducing toxics an estimated 40% - 60%.

In addition, a wide variety of measures both mandatory and voluntary which have been implemented in recent years have improved the reliability of wastewater controls (regular testing, monitoring and reporting, spill control plans, etc.)

b. Dioxins, Furans, and Chlorinated Organics

During the early 1990's, water pollution control efforts focused on chlorinated organics, specifically dioxins and furans.

The U.S. bleached kraft pulp and paper mills on the Columbia River voluntarily undertook early initial measures to reduce dioxins (2,3,7,8 TCDD) and furans shortly after the discovery of these substances in fish tissue in the late 1980s. Subsequently in 1991, EPA Region X implemented a strategy to formalize further dioxin reductions under the Clean Water Act "total maximum daily load" (TMDL) process. The NPDES permits held by the bleached kraft mills were re-issued by the states of Washington and Oregon, incorporating effluent limits for dioxin to satisfy the allocation specified in the Columbia River dioxin TMDL. The net effect of these reductions in the early 1990's was estimated by EPA to reduce dioxin discharges from the U.S. pulp and paper mills by over 95% and to reduce total dioxin discharges to the river by 90%. The Lower Columbia River Bi-State Water Quality Program identified approximately 150 point sources of dioxin to the river system. Of these, the seven pulp and paper bleached kraft mills in the Columbia Basin are now the only regulated and controlled sources.

EPA is in the process of final promulgation of the "Cluster Rule" which will implement new technology-based standards for the pulp and paper mills and require dioxins, furans and 12 other chlorinated phenolics to be non-detectable in bleach plant effluent (prior to entry to the mill's waste water treatment system). Also, total chlorinated organics measured as AOX will be greatly reduced.

Due to a combination of early voluntary efforts and permit requirements implementing the dioxin TMDL for the Columbia River, the U.S. bleached kraft mills on the Columbia, Willamette and Snake Rivers are currently in substantial compliance with the pending Cluster Rule requirements for the specifically named dioxins, furans and chlorinated phenolics; as well as the AOX requirement.

c. ESA Consultations for Fish and Wildlife

The Columbia River dioxin TMDL was prepared by EPA Region X on behalf of the states of Oregon and Washington; consequently as a "federal action," the consultation provisions of the Endangered Species Act were triggered. Several consultations were undertaken:

(1) Following consultation regarding fish in 1993:

NMFS determined that the dioxin TMDL is not likely to adversely affect listed Snake River salmon, namely sockeye, spring/summer Chinook salmon and fall Chinook salmon.

(2) Following consultation regarding eagles in 1994:

Fish and Wildlife Service (F&WS) prepared a Biological Opinion, in response to EPA's initiation of formal consultation, on Bald Eagles which allowed "incidental take" provided certain conditions were met.

(3) Following consultation regarding other species in 1993:

EPA Region X also requested F&WS concurrence through informal consultation with its biological assessment that species other than Bald Eagles are less likely to be affected (Peregrine falcon, Columbia white-tailed deer, brown pelican, marbled murrelet and Aleutian Canada goose).

d. Implications for Fish and Aquatic Environment

The pulp and paper industry has funded extensive water quality research on the Columbia River system through research organizations such as the Lower Columbia River Bi-State Water Quality Program and individual mill efforts. In addition, the industry funds a wide variety of research programs through National Council for Air and Stream Improvement (NCASI) on effects of forest practices and discharges of the mills to air and water. Also, the industry tracks and monitors the efforts of independent researchers.

The wide variety of environmental research and controls (both voluntary and mandatory) undertaken by the pulp and paper industry has generally benefitted the environment and the aquatic health of the Columbia River specifically.

Based on the continuous testing and research sponsored by the mills, it is unlikely that properly treated effluent from bleached kraft mills is associated with harm to the aquatic environment. The pulp and paper mills now have over 15 years of acute toxicity test results using rainbow trout eggs (similar to steelhead) and are able to demonstrate 100% survivability. As a consequence, the states of Washington and Oregon are phasing out this test requirement in the next round of NPDES permits. Instead, the focus will shift to chronic toxicity testing using a variety of sensitive test organisms.

In recent years, increasing questions have been raised about the effects of remaining very small trace contaminants (from all sources) on fish health and the possibility of synergistic or additive effects, such as when dioxin is found in conjunction with PCBs. At this time, the trace contaminants found in Columbia River fish species appear to be below levels tentatively linked with adverse effects to fish The Lower Columbia River Bi-State Water Quality Program study of fish health impacts was inconclusive.

PPI 2 - P - *Summary of Specific Measures undertaken by the Pulp and Paper Industry*

Measures pursued by the pulp and paper industry have included compliance with regulatory requirements and operations and spill control provisions, voluntary measures and research programs.

a. Regulatory Requirements

The most significant, and the most directly applicable, federal EPA, Washington Department of Ecology and Oregon Department of Environmental Quality regulations are listed below:

(1) Federal EPA Regulations

National Pollutant Discharge Elimination System (NPDES) Permit Regulations, 40 CFR Part 122. which include:

Regulations on State NPDES Permit Program Requirement, 40 CFR Part 123.

National Pollutant Discharge Elimination System Regulations, 40 CFR Part 125.

Requirements for Water Quality Planning and Management, 40 CFR Part 130.

Procedures for Approving State Water Quality Standards, 40 CFR Part 131.

General Provisions for Effluent Guidelines and Standards, 40 CFR Part 401.

Effluent Guidelines and Standards for Pulp, Paper and Paperboard, 40 CFR Part 430.

(2) Washington Department of Ecology Regulations

Water Quality Standards for Surface Waters of the State of Washington, Ch 173-201A WAC which include:

Sediment Management Standards, Ch. 173-204 WAC.

Whole Effluent Toxicity Testing and Limits, Ch 173-205 WAC.

National Pollutant Discharge Elimination System Permit Program, Ch. 173-220 WAC.

(3) Agency Guidance

EPA and Ecology maintain large libraries of documents providing guidance and interpretation of the water quality and NPDES permit program regulations.

b. Operations and Maintenance (O/M) and Spill Control Practices

NPDES permits typically contain special planning provisions such as:

- waste water treatment system operating plan
- solid waste management plan
- spill prevention, containment and countermeasure plan (on-site).

c. Voluntary Supplemental Measures

In addition, the pulp and paper mills on the Columbia River system have undertaken the following supplemental measures:

- participation in Clean Rivers Cooperative, a voluntary organization which provides emergency response for spills in the river.

- voluntary removal of PCB transformers

-most mills have fish screens on in-take water structures

d. On-going Forest Products/Pulp and Paper Environmental Research Programs

The forest products/pulp and paper industry funds a wide variety of environmental research. Most of this research is summarized separately by NCASI.

For summary purposes, this research can be categorized as follows:

- On-going experimental research programs by NCASI
- Special collective projects such as funding for the Lower Columbia River Bi State Water Quality program and Biomonitoring Study
- Individual mill aquatic health studies in receiving waters (separate from studies required in conjunction with NPDES permits)

B. LCR PORT MEASURES

The nature of the business of ports in the lower Columbia River, at the margin of a public waterway requires a full spectrum of local, state, and federal permits. For example, if an action to be undertaken by the Port of Portland is located within the Columbia River, dual water quality certifications from Oregon and Washington are required in addition to permits from the U.S. Army Corps of Engineers. This would apply to all Columbia River ports.

The following measures are associated with port activities in the LCR. These measures are designated beginning with an abbreviation of the agency or industry type, followed by the number of the measure, followed by an E, P, S, or O, indicating whether the measure provides enhancement, protection, support, or other (Cramer and Willis 1997). The abbreviations that are used for agency or industry type in this section are as follows:

POP - Port of Portland
LCRP - Lower Columbia River Ports

POP 1 - P - *Dredging Activities*

Dredging activity and disposal of dredge material from dockside maintenance activities is accomplished according to an approved dredge and disposal plan, and is strictly controlled through a permitting process. The channel maintenance dredging and disposal is conducted by the COE under an approved plan, and dredging actions are reviewed annually by a team of state and federal resource and environmental agencies and by the COE.

The Port of Portland will continue to develop dredge activity and disposal plans prior to maintenance dredging, and will work cooperatively with state and federal regulatory agencies to minimize potential impacts to salmon and steelhead from necessary dredging operations.

Dockside dredging at a particular location occurs on an infrequent basis and over a very limited area. The Port manages only five slips where access is maintained through dredging. Four of these terminals are located in the lower Willamette River, and one is located just above the mouth of the Willamette in the Columbia River. The need for maintenance dredging at port facilities in the Willamette and Columbia rivers is a function of flow and sediment load in any given year. In medium and high flow years annual dockside surveys will usually identify the need for one maintenance dredging project. The location dredged and volume of material removed varies from year to year. As an average, the projects in any given year total 4,000 to 5,000 feet of dock frontage with volumes ranging from 10,000 to 30,000 cubic yards of substrate. The areas must be dredged to maintain access to the marine terminals.

The Port of Portland anticipates expansion of its marine facilities in the Hayden Island area sometime in the next decade. An environmental impact statement is under development for this Port expansion project, which is located on the western end of Hayden Island in the Columbia River. Consequently, the project is currently under design planning and environmental review by state and federal regulatory agencies. Impacts from development of these new facilities will be mitigated according to agreements reached with the regulatory agencies. The new facilities will be managed in accordance with the same policies, guidelines, and regulations that govern management of existing facilities.

The average number of dockside areas dredged at Port facilities in the Portland Harbor and Columbia River on an annual basis is one site, and the average number of days during which dredging activities occur at these sites is one to two weeks, which includes setup and take down time. Because dockside maintenance dredging occurs infrequently and over relatively small areas in relation to the overall size of adjacent shoreline stream habitat, the risk of physical injury to steelhead migrating through these areas is very small. However, the timing of both channel and dockside dredging activity is regulated to minimize any potential impacts to fisheries resources. Dredging in the lower Columbia River is limited to the period from November 1 through February 28, and dredging in the lower Willamette River and Multnomah Channel is limited to the periods from July 1 through October 31 and from December 1 through January 31. These "work windows" define the periods when salmon and steelhead are least abundant in these work areas.

NOTE: The Port of Portland owns and operates the dredge, Oregon, which is a 30 inch pipeline dredge contracted for use to the COE for maintenance of the Columbia River Channel. The dredge is also used to provide fill for industrial land development under strict state and federal guidelines. Most dockside maintenance projects are contracted to private companies. They generally use a clamshell type dredge. As previously noted, channel maintenance is conducted by the COE under their rules and guidelines. It is currently authorized under an existing Biological Assessment issued by the NMFS.

POP 2 - P - ***Sediment Testing at Port of Portland Dredge Sites***

The Port of Portland will test sediments at all new and maintenance dredge sites for contaminants in conjunction with state and federal regulatory requirements as a part of the dredging activity permitting process. All conditions of issued permits will be followed to assure avoidance of significant impacts to salmon and steelhead resources.

Channel dredging occurs at an average depth of 40 feet while juvenile salmonids migrate primarily within ten to fifteen feet of the water surface. Dredging also occurs in main channel areas while adult salmonid migration is typically shore oriented. As a result, the physical activity of dredging in the mainstem Columbia River channel area presents little risk of impacts to adult or juvenile steelhead migrating through the lower Columbia River. In the Biological Assessment (BA) prepared by the COE (USACE) for maintenance dredging activity in the lower Columbia River, dredging activity was not found to present a significant risk to fisheries resources providing it was conducted in accordance with the

BA. That is, turbidity from dredging in the coarse grained sands of the main channel was not considered to be a problem according to the NMFS Biological Assessment.

POP 3 - P - *Dredge Material Disposal*

The Port of Portland will comply with dredge material disposal requirements as defined in permits issued by the state and federal regulatory agencies to avoid impacts to salmon and steelhead resources.

Sediments, whether clean or contaminated, are disposed of according to regulatory agency guidelines and requirements and according to an approved disposal plan. Prior to any dredging project conducted by the Port, a dredging plan is developed which includes a sediment sampling strategy and defined disposal location. If the project is approved, sampling and an engineering design study are conducted. Results from these efforts are submitted to the COE and to other regulatory agencies for review prior to commencement of any dredging activity.

POP 4 - P - *Reduce Pollutants in Stormwater Runoff*

The Port of Portland Municipal Storm Water Management Plan (Plan) was approved by the Oregon Department of Environmental Quality (ODEQ). This Plan describes a series of Best Management Practices (BMPs) to be implemented throughout the 5 year Municipal Permit term. The Port collects data on runoff water quality from the range of industrial activities occurring on Port property. The Portland International Airport is approximately 3,771 acres in size with its runoff entering the Columbia Slough through 8 outfalls. The Port's industrial parks area comprises approximately 990 acres. Stormwater runoff from this area discharges into the Willamette River, the Swan Island channel, and the Columbia Slough. The marine terminals operating area consists of approximately 1,041 acres with its stormwater runoff entering the Willamette and Columbia rivers.

The Portland Ship Repair Yard is approximately 140 acres in size and is leased to Cascade General Corporation, who is responsible for the day-to-day water quality compliance requirements. Cascade General has recently installed new high capacity water treatment facilities for handling runoff and water used to service ships in dry dock. They also are required to abide by an extensive list of BMPs. They have developed a blocking and recovery system to prevent sandblasting or other materials that are byproducts of their operations from entering waterways and contaminating water or sediments. These materials are disposed of according to approved procedures.

The Port of Portland's full stormwater management program is contained in the "Annual Compliance Report No.2 - Fiscal year 1996-97". This program began approximately 4 years ago. Because it is a relatively new program, its environmental benefits have not yet been fully realized. The program contains a full array of measures, from sampling requirements through training and tenant compliance requirements. These measures will assure improved water quality in the future with respect to the activities of the Port.

Prior to the implementation of the federal stormwater management program, surface water runoff from Port of Portland facilities entered the Willamette and Columbia rivers through storm drains. This runoff was not monitored, sampled or tested. It is not known what volumes or types of pollutants entered the public waterway system through annual surface runoff. This situation was the same at other ports throughout the lower Columbia River area.

Recent implementation of the stormwater management program under the federal Clean Water Act (CWA) has brought Port of Portland operated facilities and tenants of the Port under federally mandated reporting and management guidelines. In Oregon, ODEQ provides oversight for this program for all ports, for municipalities, and for the Oregon Department of Transportation. With the implementation of the stormwater management program, the level of contaminant loading from surface water runoff at Port properties will be controlled to meet acceptable standards. The Washington Department of Ecology (WDOE) oversees the stormwater management program in the state of Washington.

The Port of Portland will cooperate with the City of Portland and with state and federal regulatory agencies to insure the effective implementation of the Port's stormwater management program and to meet associated standards under the federal Clean Water Act in order to protect salmon and steelhead resources. Tenants of the Port will also be required to meet these standards.

POP 5 - P - ***New Construction***

The Port of Portland will use steel or cement pilings in new construction.

POP 6 - P - ***Reduction of Toxic Substances***

The Port of Portland has banned the presence of certain toxic substances on Port property and requires other environmental safeguards and controls through specific language in lease agreements with its tenants.

A summary of toxic substances that are banned on property managed by the Port of Portland is presented in Table 3.

Table 3. Toxic substances banned or regulated on property managed by the Port of Portland.

Prohibited Chemicals	Regulated Chemicals
Polychlorinated biphenyl compounds (PCB's)	**All lead containing materials**
Asbestos and asbestos containing materials	**Cadmium**
Methyl bromide	**OSHA's list of regulated carcinogenic materials**
Tricholorethylene (TCE)	
Ozone delpleting products (e.g. Halon, Target	
CFC refrigerants	
Radioactive materials	

Following is a description of key assets and transportation services under management by the Port of Portland. This information is provided to characterize the scope of the Port's water quality programs as they relate to protection of salmon and steelhead resources.

a. Port of Portland Aviation

The Port of Portland owns and operates Portland International Airport, Mulino Airport, Hillsboro Airport and Troutdale Airport. Although these facilities are not located on the water, they do have surface drainage that enters public waters. A large portion of the airport property is leased to private parties and businesses. This is particularly true at the smaller "reliever" airports listed above. These facilities currently fall under the new federal stormwater management permit program.

b. Port of Portland Properties

The Properties Division manages large blocks of industrial development land in the Rivergate area (see attached Map) and throughout the Portland Metro area. Like the situation with the Airport, much of this land is leased. It differs from the Airport in that much of the land is in the development stages and is sold when development infrastructure is completed. These properties also fall under the new federal stormwater management controls.

c. Port of Portland Ship Repair Yard

The shipyard is currently under lease to Cascade General. They are fully responsible for environmental management at that facility as described above.

The nature of the Port of Portland's environmental actions and programs over the past 10 years has been to implement measures designed to identify problem areas and prevent problems from occurring. Programs associated with most of the measures presented here have been in place for several years or longer. Examples of other environmentally related actions that the Port has voluntarily taken include the following:

- The Port funded a 4-year study, in cooperation with ODFW, in the Lower Willamette River Harbor area to assess impacts of structural development on juvenile salmon and steelhead migrants.
- Lower Columbia River ports, including the Port of Portland, funded a portion of the Lower Columbia River Bi-State Study to help provide a base of knowledge for current planning actions.
- The Port is funding a portion of the effort to develop and provide this report regarding an assessment of the status of Lower Columbia River Steelhead and an evaluation of measures for achieving recovery of this resource.
- The Port provided staff support and co-authorship in developing a status assessment of Willamette River spring chinook salmon. Lower Columbia River ports, including the Port of Portland, are supporting the COE eco-restoration program.
- The Port maintains a 24-hour, 7-day-a-week environmental hotline to receive calls on any environmental emergency associated with Port functions, and to be able to coordinate an immediate response. All of the Port's Environmental Department staff carry beepers, and key staff carry cell phones, to ensure effective implementation of the Port's rapid response plan.
- The Port has adopted environmental policies and guidelines to provide guidance to all Port staff.
- The Port conducts regular environmental training sessions in all of its operating areas to update staff on environmental issues, policies, guidelines, and procedures.

LCRP 1 - S - *Sediment Testing at Lower Columbia River Ports*

The lower Columbia River ports will provide funding in excess of $240,000 for sampling of sediments associated with channel deepening in the lower Columbia River. The purpose of this sampling is to characterize the composition of sediments, to develop proper disposal plans, and to assess disposal area construction costs. Prior to any actual dredging, additional chemical testing will be done on a site-by-site basis to assure that harmful contaminants are not present in areas to be deepened.

C. ELECTRIC UTILITY MEASURES AND MEASURES RELATING TO DAMS

These measures are designated beginning with an abbreviation of the agency or industry type, followed by the number of the measure, followed by an E, P, S, or O, indicating whether the measure is intended to provide enhancement, protection, support, or other (Cramer and Willis 1997). The abbreviations that are used for agency or industry type in this section are as follows:

TPU - Tacoma Public Utilities
PacifiCorp - Pacific Power and Light
USFS - United States Forest Service

TPU 1 - E - *Cowlitz Falls and Cowlitz Basin Anadromous Salmonid Restoration Program*

Tacoma Public Utilities is working cooperatively with WDFW, the Bonneville Power Administration (BPA), and the Friends of the Cowlitz (FOC) to reintroduce self sustaining populations of salmonids, including late returning winter steelhead, into the upper Cowlitz River Basin above Cowlitz Falls. Details of this program are presented in the Hydro/Dam Supplement to Washington's Lower Columbia Steelhead Conservation Initiative.

PacifiCorp 6 - E - *Assist with Lower Lewis River Tributary Enhancement Projects Currently Proposed by the Us Forest Service and the Lewis River Fish Enhancement Group*

PacifiCorp will provide partial funding, technical assistance, and large woody material from Swift reservoir for habitat restoration projects on key tributaries to the Lewis River including Cedar Creek, Colvin Creek and the East Fork Lewis River.

The US Forest Service (USFS) is currently conducting habitat restoration efforts on the East Fork Lewis River for the benefit of all life stages of steelhead. The Lower Lewis River Fish Enhancement Group (Fish First) has developed, and is implementing, a Cedar Creek restoration project for the benefit of salmonids. PacifiCorp has contributed some technical assistance to the Cedar Creek project and assisted USFS with securing large woody material from Swift Reservoir for the enhancement efforts. PacifiCorp proposes to continue its participation and to commit funding to aid in the completion of the Cedar Creek and East Fork Lewis River projects. In addition, PacifiCorp will continue providing field assistance to WDFW for the purpose of conducting steelhead spawning surveys on Cedar Creek and provide for efforts at Lewis River hatchery to mark and hold spawned out carcasses for nutrient enrichment programs in the basin.

PacifiCorp 7 - S - ***PacifiCorp to Fund Fish Marking Program and Creel Survey of Lower Lewis River Steelhead to Determine Hatchery Steelhead Contribution and Impact to Wild Steelhead***

PacifiCorp will fund a Merwin hatchery evaluation to determine the effects the hatchery produced winter and summer steelhead are having on the wild Lewis River steelhead components.

Merwin trout hatchery was constructed as required in the FERC license for Merwin Dam to mitigate for losses incurred by the native Lewis River steelhead populations. Beginning immediately, PacifiCorp will fund an evaluation of the effect of hatchery produced steelhead on the wild steelhead components. In order to accomplish this, steelhead produced at Merwin hatchery that were marked with an identifying coded wire tag will be evaluated in a creel survey beginning in the fall of 1997 and continuing through the fall of 2000. In addition, hatchery released smolts will be captured in the mainstem to determine timing of emigration from the river and the extent of interaction with wild salmonids, including steelhead, spring and fall chinook, and cutthroat trout.

PacifiCorp 8 - S - PacifiCorp to Study Reservoir Passage Criteria ***for Downstream Migrating Smolts***

PacifiCorp is committed to participating with other regional utilities in implementing a long-term study to determine reservoir passage criteria for downstream migrating smolts and to establish uniform reservoir passage at all Pacific Northwest reservoirs.

PacifiCorp 9 - S - ***PacifiCorp to Review Current Flow Regime for Merwin Dam with Agencies to Determine Effects on All Steelhead Life Stages***

PacifiCorp will participate in a review of the present Merwin Dam minimum flow schedule to determine potential effects on steelhead.

As part of Article 49 of the current FERC license for Merwin Dam, PacifiCorp and the Washington Department of Fish and Wildlife (WDFW) conducted a 10 year evaluation of Merwin Dam flows to establish minimum flow regimes for the benefit of the Lewis River wild fall chinook salmon population. The current flow schedule is presented in Table 4.

Table 4. Historic (1983) and current (as of 1993) annual flow schedules for Merwin Dam on the Lewis River in Washington.

Period	1983 License (cfs)	1993 Revision (cfs)
December 8-March 1	1500	1500
March	2700 2700 to 1000	2000 2000 to 1000
April	2700 2700 to 1300	2700 2700 to 1300
May June	2700 2700 to 1650 2500 Natural or 1650	2700 2700 to 1650 2700 Natural or 1650
July 1 - July 15	2000 Natural or 1200	2000 Natural or 1200
July 16 - July 31	1500 Natural or 1200	1500 Natural or 1200
August 1 - October 15	1200	1200
October 16 - October 31	2700	2700
November 1 - November 15 November 16 - December 7	Natural + 2000 or 4200 Natural + 2000 or 5400	Natural + 2000 or 4200 Natural + 2000 or 5400

These established flows may or may not benefit steelhead. PacifiCorp will consult with agencies to determine the effects of the current flow regime on steelhead in the North Fork Lewis River.

PacifiCorp 10 - S - *Complete a Basin-wide Lewis River Watershed Analysis*

PacifiCorp is currently conducting a basin-wide watershed analysis of the Lewis River watershed. This analysis will be completed by May 2001. The purpose of the watershed analysis is to identify resource issues, list potential impacts of PacifiCorp's projects and other watershed activities, determine key questions related to each resource and ultimately identify potential enhancements. PacifiCorp has solicited the involvement of agencies, tribes and environmental groups to participate in the scoping, study design and review, technical work groups and development of enhancements. Finally, a settlement agreement will be developed and agreed upon by participating parties. The process is currently in the scoping phase with studies anticipated to begin in March or April 1998. PacifiCorp commits to completion of the process and development of a settlement agreement for it's Lewis River hydroelectric project enhancements. Enhancement measures identified as a result of the Watershed Analysis will be implemented upon completion of the Lewis River settlement agreement.

USFS 1 - E - ***Improve fish ladder attraction flow and screening at Hemlock Dam***

The Gifford Pinchot National Forest has developed additional attraction flow for the fish ladder at Hemlock Dam to improve adult steelhead upstream migration. A fish ladder wall extension was also constructed to more effectively direct attraction flow. Screening for the intake at the dam is being upgraded to current state and federal standards. The three-year project will be completed in the fall of 1997.